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TRANSCRIPT OF RECORD.

SUPREME COURT OF THE UNITED STATES.

OCTOBER TERM, 1890.

No. 1215.

JAMES W. FELLOWS, RICHARD C. FELLOWS, JULIA CODDINGTON, ET AL., APPELLANTS,

vs.

WILLIAM T. WALKER, AUDITOR; JAMES K. HAMILTON, MAYOR; GEORGE H. COLE, CLERK; WILLIAM W. JONES, CLARENCE BROWN, ABNER L. BACKUS, THOMAS H. TRACY, AND JOHN E. PARSONS, NATURAL-GAS TRUSTEES OF THE CITY OF TOLEDO, AND THE CITY OF TOLEDO.

APPEAL FROM THE CIRCUIT COURT OF THE UNITED STATES FOR THE NORTHERN DISTRICT OF OHIO.

FILED JULY 14, 1890.

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a *Pleas.*

Pleas in the circuit court of the United States for the northern district of Ohio, western division, held at the United States court-rooms, in the city of Toledo, in said district aforesaid, before the Honorable Howell E. Jackson, circuit judge for the sixth circuit, and Honorable Augustus J. Ricks, district judge for the district aforesaid, on the fifteenth day of January, A. D. 1890, the same being a day of the December term, 1889, of said court, in the year of our Lord one thousand eight hundred and eighty-nine, and in the one hundred and fourteenth year of the Independence of the United States of America.

461

MARTIN W. SANDERS, *Clerk.*

461 1 And thereupon, to wit, on the 18th day of May, A. D. 1889, there was duly filed in the clerk's office of said court *to* following bill, to wit:

461

Bill.

461 United States Circuit Court, Northern District of Ohio, Western Division. In Equity.

463 To the judges of the circuit court of the United States for the northern district of Ohio, western division:

465 James W. Fellows, Richard C. Fellows, Julia Coddington, Mary
466 Hoyt, Edward H. Schell, Mary E. Schell, Florence A. Cragin, Jane H. Cragin, Elizabeth S. Cragin, Wallace C. Andrews, of the city of New York and citizens of the State of New York; Theodore M. Towle, of the city of Brooklyn and a citizen of the State of New York; Robert Schell, Edward H. Schell, and James W. Fellows, executors and trustees of the last will and testament of Augustus Schell, deceased, of the city of New York and citizens of the State of New York, and John B. Carson, of the city of Chicago and a citizen of the State of Illinois, bring this their bill of complaint against William T. Walker, auditor of the city of Toledo; James K. Hamilton, mayor of said city of Toledo; George H. Cole, clerk of said city; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, gas trustees of said city, and the City of Toledo, citizens of the State of Ohio, in said district and division.

And thereupon your orators complain and say that they are severally the owners of and tax-payers upon a large amount of real estate situate within said city of Toledo, and they bring this suit in behalf of themselves and also in behalf of a large number of like citizens, non-residents of the State of Ohio, who are also the owners and tax-payers upon a large amount of real estate situate within said city of Toledo, said property in all amounting in the aggregate, as valued and assessed on the tax duplicate of Lucas county, Ohio, within which county said city is situate, to upwards of one million of dollars, said sum being about one-thirtieth ($\frac{1}{30}$) of the

grand aggregate duplicate valuation of the personal and real property of said city as assessed on said duplicate for taxation.

That the said other parties in whose behalf this suit is brought are numerous and cannot, without considerable inconvenience and delay, be brought before this court by name, but that the complainants herein represent their interests in the several matters set forth and complained of herein.

That the said city of Toledo is a city of the third grade of the first class, within said State of Ohio.

That on the twenty-second day of January, 1889, the General Assembly of the State of Ohio passed an act entitled "An act to authorize cities of the third grade of the first class to borrow money and issue bonds therefor for the purpose of procuring territory and right of way, sinking wells for natural gas, purchasing wells and natural gas works, purchasing and laying pipes, and supplying such city with natural gas for public and private use and consumption;"
2 which act of the said General Assembly is found in the Session Laws of said State of A. D. 1889, volume 86, at pages 7, 8, and 9.

That the said James K. Hamilton, the mayor of said city of Toledo, on the — day of March, 1889, caused to be published a notice of the election, as set forth and required by said act, in several of the newspapers in said city, that the question of authorizing the issue of said bonds would be submitted to said voters of said city at the municipal election to be held therein on the following first day of April, 1889.

The municipal election in said city next after the passage of said act occurred on Monday, the first day of April, 1889, and at said election the qualified voters of the said city of Toledo voted on the proposition for the authority to issue said natural-gas bonds, and the returns of said election show that more than sixty per cent. of those voting upon said proposition voted therefor.

That thereafter, on the 12th day of April, 1889, the Governor of the State of Ohio, as in such act provided, appointed William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown as the trustees named in said act, and issued to said last-named parties certificates or commissions showing their appointment and the respective terms thereof.

That on the 27th day of February, 1889, the said General Assembly of the State of Ohio passed an act entitled "An act supplementary to chapter three, division eight, title twelve, of the Revised Statutes of Ohio," which act of the said General Assembly is found in the Session Laws of A. D. 1889, volume 86, at pages 58 and 59, and said act has no other title than the one above expressed.

That since the appointment of said trustees by the said Governor of said State the said trustees have assumed to organize as a board by the election of the said Wiliiam W. Jones as president thereof, and have already, and without any authority from the said city council of the said city of Toledo, and without having funds appropriated for that purpose, and before the city council had passed any ordinance for the issuing of said bonds or any part thereof or other-

wise determined that the said city shall issue the same or any part thereof, incurred expense and liability and contracted debts in the name and on behalf of said city in various ways, assuming and asserting that they have the right and authority to do so, and that the city of Toledo will be liable therefor and bound to pay the same out of funds hereafter to be raised by taxation.

That the said city of Toledo is the only city of the third grade of the first class in the said State of Ohio and the only city to which the said act of the General Assembly is or can be applicable.

That said city of Toledo contains within its corporate limits about twenty-five (25) square miles of territory and over two hundred and fifty (250) miles of established and laid-out streets; that about one-fourth ($\frac{1}{4}$) of the territory embraced in said city limits has not been laid out into lots or streets and alleys, and is contained in
3 large tracts of land undivided and not intersected by streets and alleys; that not more than one-fifth of the balance of the territory in said corporate limits is built up or occupied by houses or structures or by inhabitants.

That the population of said city is about one hundred thousand, the population at the last Federal census being about fifty thousand.

That the total duplicate valuation of all the property, real and personal, in said city of Toledo is less than $32,000,000, and the total indebtedness of said city of Toledo now exceeds three and one-half millions of dollars ($3,500,000); that the present rate of taxation in said city is two cents and seven mills on every dollar of the duplicate valuation of the real and personal property of said city; that said rate does not embrace any special taxes or assessments for the construction of sewers, lighting the streets, grading, paving, or otherwise improving of its streets, alleys, or public places or other special improvements, which aggregate annually large sums of money, to wit, upwards of one hundred thousand dollars annually, and for the payment of which the costs are assessed upon the improved and unimproved property of said city.

That the burden of taxation in said city is now excessive and as heavy as can or ought to be borne by its citizens and tax-payers; and plaintiffs aver that the city of Toledo is so improved and built up that, while the population does not exceed 100,000, as hereinbefore stated, its inhabitants are scattered over a large part of the entire area of the city and are found in all directions, who will, if said pipe line mentioned in said act is constructed, be taxed therefor without receiving the benefit contemplated by said act, unless most if not all of said streets of said city are piped ready to supply all of the citizens within said city of Toledo located thereon with said natural gas.

That to purchase and acquire the necessary territory, construct the line from without said city into said city, and pipe the said streets of said city so as to enable the said city to furnish all the residents and citizens thereof that will be assessed and taxed therefor with natural gas for fuel will cost from three millions to five millions of dollars, as complainants are informed and believe and

so charge the fact to be, and that it will require for the construction and completion of said work from two to three years time.

That long before the same could be built and said streets piped the said city council of said city of Toledo will have the right under existing laws to fix the price of gas to be charged by the now existing companies at such a price as will be fair and just and furnish a fair and adequate return for the money invested; that if the city should itself engage in the business of constructing a pipe line, piping the streets of said city and furnishing gas to consumers therein at any price less than that which it might and may thus fix by ordinance for the existing companies, will necessarily result in placing an unjust and inequitable burden upon the property of those who do not use said gas and whose property is unimproved,
4 and will result in a large tax and assessment being placed upon the many for the benefit of the few.

That there is no present necessity, advantage, or benefit to the city or its citizens to be derived from engaging in an enterprise which is peculiarly speculative and of a business character or incurring the indebtedness aforesaid; that to engage in such enterprise and business will result in unnecessary, burdensome, and unjust taxation, and in its operation and effect will violate the rule of equity in taxation and result in confiscating or appropriating private property without compensation, benefit, or advantage, and cause great and irreparable injury to the said complainants and those in whose behalf this suit is brought.

That there are now within said city of Toledo, engaged in said business of furnishing and supplying gas to consumers, two private corporations, viz., the Northwestern Ohio Natural Gas Company and the Toledo Natural Gas Company, incorporated under and by virtue of the laws of the State of Ohio, of the General Assembly of said State of Ohio, and are now supplying said city of Toledo and the citizens thereof with natural gas for fuel and heating purposes, having piped the same from the gas fields of Wood and Hancock counties, in said State, to said city of Toledo, and laid pipes in all of the populous streets of the said city of Toledo, and are now supplying all of the citizens of said city on the line of said streets so piped who desire to use the same for fuel or heating purposes.

That on the 6th day of September, 1886, the said city council of the city of Toledo passed an ordinance granting to said Northwestern Natural Gas Company the right to lay pipes in said streets of said city to supply said gas to its citizens, a true copy of which ordinance is found in the records of the ordinances of the city of Toledo and will be filed herewith, and to which reference is here made, and made a part hereof the same as if it were fully copied herein, and which said ordinance gave to the said company the right, upon certain conditions therein named and which have been complied with by said company, and which constituted the consideration therefor, to lay and maintain pipes, regulators, fixtures, and machinery in the streets, highways, lanes, alleys, &c., of said city for the purpose of supplying gas to consumers in said city of Toledo, and to the terms

of which said company assented and agreed, and the same constituted a valid and existing contract with said city, which is now in full force and effect and under which said company and the other company hereinafter named have piped a large part of said city and incurred a very large outlay and expense.

That at or about the same time an ordinance substantially the same as the one above mentioned was also passed by the said city council of said city of Toledo granting to said Toledo Natural Gas Company the same rights and privileges as set forth in said ordinance to said Northwestern Ohio Natural Gas Company and subject to the same terms and conditions, and that under said ordinances both of said companies have laid their main pipes from the gas field—a distance of some thirty-six to forty miles from the city—into the city and have piped the streets of said city as aforesaid, and are now furnishing said natural gas to the consumers within said city for domestic purposes and to the manufacturers thereof for manufacturing purposes.

That on the 4th day of March, 1887, the said General Assembly of the State of Ohio passed an act entitled "An act to amend sections 2478 and 2491 of the Revised Statutes of Ohio," whereby the power was conferred upon the council of the said city of Toledo to fix the price to be charged to consumers for said natural gas so furnished by said companies, and which act of said General Assembly will be found in Session Laws of A. D. 1887, volume 84, Ohio Laws, at page 39; that said law only authorized the city council to fix the price to be charged by natural or artificial gas companies, and does not authorize said city council to fix the price or any prices to be charged by said natural gas trustee, but, on the contrary, the said act passed on February 27th, 1889, entitled "An act supplemental to chapter three, division eight, title twelve, of the Revised Statutes of Ohio," undertakes to make the said general law applicable to said natural gas trustees, and, if it gives said trustees any power, authorizes them to fix the price to be so charged to its consumers, thus conferring corporate power on said city of Toledo by a special act exempting said city of Toledo from the operation of said general law of March 4th, 1887, and creating and authorizing an unlawful, unjust discrimination against existing and vested rights in favor of said natural gas trustees and said city of Toledo in its contemplated business of selling gas for fuel to its citizens and public and private consumers, and said act is in violation of and inhibited by sections one and six, article 13, of the constitution of the State of Ohio.

That the said city council of the said city of Toledo, by ordinance passed July 9th, 1887, fixed the price to be so charged by said companies for the period of three years from the date of such ordinance, during which time said city council in and by said ordinance agreed that it would not require said companies, by ordinance or otherwise, to furnish said gas at any less price than named in said ordinance, and said companies filed their acceptance thereof in writing with the city clerk of said city, and said ordinance is now in full force and effect and in operation and a valid and subsisting contract with said natural gas companies, and said natural gas companies have

now about one hundred miles of pipe laid in the streets of said city and are supplying gas therefrom, and said act is in violation of the provisions of section 28, article 2, of the constitution of the State of Ohio.

Complainants further say that there is no natural gas to be procured, as complainants are informed and believe and so charge the fact to be, at any nearer point to the city of Toledo than a distance of about thirty miles; that the whole plan and purpose of said law is to furnish to certain parts of the city gas at public expense to enable the owners of said real estate therein to offer the same to manufacturers, who might be induced thereby to locate on
6 said real estate manufacturing establishments because of the inducement of cheap fuel which it is contemplated to offer them through said city pipe line, thus enabling said city of Toledo to lend its aid and credit to private enterprises and private interests and expend the public moneys for the benefit of private enterprises and purposes.

That there is no provision in said law for the expenditure of any money for the purpose of extending said proposed gas line beyond the sum mentioned in said act, of $750,000, and which said sum is wholly inadequate to buy the territory, construct the line and pipe the streets of said city, and furnish gas to the consumers therein; that said law authorizing said city to engage in said business and borrow money therefor upon bonds to be issued by it is in conflict with article eight, section six, of the constitution of the State of Ohio.

That the business of furnishing fuel and heat to private citizens or corporations is not such a public purpose as will authorize the levy of taxes therefor, and said municipality, if it issues said bonds, must meet and pay the interest and principal thereof by a general levy, as provided in said act, upon all the property, personal and real, situate within said city, in addition to the general levies now by law authorized for other purposes.

That the proposed plan of engaging in said enterprise, expending the moneys, and taxing the property-owners of said city therefor, is purely speculative, uncertain, and hazardous; that said city has no gas, no lands in which gas can be found, and no leases or gas wells or gas supply of any kind, and it will be compelled, if it resorts to the powers granted by said law, to explore, experiment, and expend a large amount of money in developing, exploring, and experimenting in boring for gas without any certainty of obtaining the same, and with great uncertainty as to quantity and duration.

That said business can only be conducted by said city of Toledo or its said officers and trustees out of moneys arising from the sale of the bonds authorized by said act and only to the extent of said bonds thus authorized, wholly irrespective of whether the same are or will be adequate or sufficient therefor.

That said contemplated investment is purely speculative and is designed, as complainants believe and so aver the fact to be, for the purpose of enabling the owners of lands or leases of territory which is undeveloped to have the same bored, investigated, and developed

at public expense, without any certainty or reasonable probability of any adequate or sufficient return therefor.

That natural gas is only found in limited territory within the State of Ohio and confined to a few counties in the western part of the State and cannot be found in or piped to any part of the State remote from said territory, and the attempted classification in said law of all cities of the third grade of the first class in said State is and must in its operation be confined to said city of Toledo, and said law is an evasion of section 26, article two, of the con-
7 stitution of Ohio, which provides that all laws of a general nature shall have a uniform operation throughout the State, nor shall any act, except such as relates to public schools, be passed to take effect upon the approval of any other authority than the General Assembly.

That the collection of taxes from the tax-payers of the city of Toledo and those owning property therein, both resident and non-resident thereof, for the purpose of supplying cheap fuel for manufacturing or domestic purposes to those who are situated so as to make it profitable or advantageous to use or utilize the same, is in conflict with and in violation of the provisions of the bill of rights of the constitution of the State of Ohio and of section nineteen, article one, of said constitution, which provides that private property shall ever be held inviolate but subservient to public welfare. The purpose for which said exaction of taxes is contemplated is not a public purpose or subservient to the public welfare, and is a private enterprise for private gain and, as before alleged, for the sole benefit and advantage of persons in such situation as to be enabled to take advantage of the fuel thus contemplated to be furnished them in their business or homes.

That said law is otherwise invalid and void for many other good and sufficient reasons in law, among which is that the said law contains no provision for the collection of any revenue from the proposed consumers of said natural gas, if any should be found or furnished under said act, or for selling the same or for providing in any manner, except by taxation on all the property both real and personal of said city, for the cost of building or operating and maintaining said line or paying for the necessary gas which will have to be purchased to be supplied to the consumers thereof through said proposed line.

No provision for the election or the appointment of successors to said trustees and no provision for supplying or paying for any deficiency that may arise in the original or any additional cost of constructing or maintaining the same.

That, notwithstanding the many things herein averred and the invalidity of said law, the said city council of the said city of Toledo did, on the 29th day of April, 1889, pass an ordinance for the issuing of seventy-five thousand dollars ($75,000) of said bonds, and the mayor of said city has signed said ordinance and has either signed or threatens to sign said bonds, and said George H. Cole as such city clerk also has signed or is about to sign said bonds, and said defendants are proposing to and have advertised the same to be sold

upon the 10th day of June, A. D. 1889, at the office of the said auditor of the said city of Toledo, for the purpose of raising money to be expended in the enterprise aforesaid. On the 18th day of May, A. D. 1889, your orators requested the city solicitor of said city of Toledo, in writing, to commence an action, as provided by section 1778 of the Revised Statutes of Ohio, and the said city solicitor then and there refused so to do.

8

Complainants ask that a preliminary injunction may be granted herein, restraining the said city of Toledo, its officers and agents, from issuing any bonds or incurring any indebtedness or obligation of any kind under the provisions of said act, or for any of the purposes therein named or contemplated, and restraining said James K. Hamilton, mayor of said city, and George H. Cole, the clerk of said city, from signing or executing any of such bonds or obligations, and restraining said William T. Walker, said auditor of said city, or said City of Toledo from selling or offering for sale, or delivering or attempting to deliver or selling, any or all of said bonds to any person or persons whomsoever, and restraining said gas trustees herein named from making or incurring any indebtedness of any kind or expending or appropriating any of the city's moneys now in their hands or the proceeds of any bonds that may now be in their hands for any of the purposes named in said act, and that upon a final hearing hereof the said injunction may be made perpetual and all of the said defendants and their successors in office may be perpetually enjoined and restrained from doing any of the acts or things herein complained of and enumerated in the above prayer for a temporary injunction; that said law may be declared invalid; that all taxation of every kind for any of the purposes named in said act may be declared illegal and void; that the said City of Toledo, its officers and agents, may be perpetually enjoined and restrained from levying or attempting to levy or collect any taxes upon the real or personal property of these complainants or either of them or any of those in whose behalf this suit is brought for any or all of the purposes named in said act, or for paying the principal or interest of said bonds or any of them, or other debt or obligation incurred or issued thereunder.

May it please your honors, the premises considered, to grant unto your complainants a writ of injunction, issuing out of and under the seal of this honorable court, enjoining and restraining the said William T. Walker, auditor of said city; James K. Hamilton, mayor of said city; George H. Cole, clerk of said city; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, gas trustees of said city, and the City of Toledo, its officers and agents, from offering for sale or selling, or transferring or otherwise disposing of said bonds or any of them.

And that your orators may have such further relief as the nature of the case requires and to your honors seem meet.

May it please your honors to grant unto your orators not only the writ of injunction, conformable to the prayer of this bill, but also a writ of subpœna therefrom to the said William T. Walker, auditor of the city of Toledo; James K. Hamilton, mayor of said city;

George H. Cole, clerk of said city; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, gas trustees of said city, and the City of Toledo, commanding them,
9 on a day certain therein named, to be and appear before this honorable court, then and there to answer the premises, and to stand to, perform, and abide such further order, direction, and decree as may be made against them; and your orators, in duty bound, will ever pray.

STEVENSON BURKE,
DOYLE, SCOTT & LEWIS,
E. D. POTTER, JR.,
Solicitors and of Counsel for Complainants.

UNITED STATES OF AMERICA,
Northern District of Ohio, Western Division, } ss:

At the city of Toledo, in the county of Lucas and district aforesaid, on this 18th day of May, 1889, personally appeared E. D. Potter, Jr., who, being duly sworn according to law, deposes and says that he is one of the solicitors of the said complainants in said suit; that none of said complainants are now within said district or State, but absent therefrom, and for that reason affiant makes this affidavit. Affiant says he has read over and knows the contents of said bill; that the facts therein stated upon information and belief he believes to be true, and as to the other matters therein stated the same are true in substance and in fact.

E. D. POTTER, JR.

Sworn to before me and subscribed in my presence this 18th day of May, A. D. 1889.

EDWARD H. SMITH,
[SEAL.] *Notary Public, Lucas County, Ohio.*

We hereby jointly and severally acknowledge ourselves security for all costs for which the complainants may be liable in this suit. May 18, 1889.

E. D. POTTER, JR.
JOHN H. DOYLE.

10 Afterwards, to wit, on the 18th day of May, A. D. 1889, there was issued from the clerk's office of said court the following writ of subpœna, to wit:

Subpœna.

UNITED STATES OF AMERICA,
Northern District of Ohio, Western Division, } ss:

The President of the United States of America to the marshal of the northern district of Ohio, Greeting:

You are hereby commanded to summon William T. Walker, auditor of the city of Toledo; James K. Hamilton, mayor of said

city of Toledo; George H. Cole, clerk of said city; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, gas trustees of said city, and the City of Toledo, if they be found in your district, to be and appear in the circuit court of the United States in and for the division and district aforesaid, at Toledo, on the first Monday in August next, to answer a certain bill in chancery filed and exhibited in said court against them by James W. Fellows, Richard C. Fellows, Julia Coddington, Mary Hoyt, Edward H. Schell, Mary E. Schell, Jane H. Cragin, Elizabeth S. Cragin, Wallace C. Andrews, Theodore M. Towle, Robert Schell, Edward H. Schell, and James W. Fellows, executors and trustees of the last will and testament of Augustus Schell, deceased; John B. Carson, Florence A. Cragin.

Hereof they are not to fail under the penalty of the law thence ensuing; and have you then and there this writ.

Witness the Honorable Melville W. Fuller, Chief Justice [SEAL.] of the United States, this 18th day of May, A. D. 1889, and in the 113th year of the Independence of the United States of America.

A. J. RICKS, *Clerk*,
By HALLIE W. BROWN,
Deputy Clerk.

11 MEMORANDUM.—The said defendants are required to enter their appearance in this suit, in the clerk's office of said court, in Toledo, on or before the first Monday of July, 1889; otherwise the said bill may be taken *pro confesso*.

A. J. RICKS, *Clerk.*

Afterwards, to wit, on the 22d day of May, A. D. 1889, said writ was returned to said clerk's office, with the marshal's return thereon in the words and figures following, to wit:

NORTHERN DISTRICT OF OHIO, *ss:*

On the 20th day of May, 1889, at Toledo, Ohio, I made due service of this writ by delivering a true and duly certified copy thereof to each of the within named: William T. Walker, auditor of the city Toledo; James K. Hamilton, mayor of said city of Toledo; George H. Cole, clerk of said city; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, gas trustees of said city, and by delivering a like copy for said city of Toledo to James K. Hamilton, its mayor.

B. F. WADE,
U. S. Marshal.

12 Afterwards, to wit, on the 29th day of May, A. D. 1889, there was filed in the clerk's office of said court the following exhibit, referred to in the bill, to wit:

EXHIBIT.

An ordinance granting to the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo for heating and power purposes, and repealing an ordinance entitled "An ordinance granting to the Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in the city of Toledo for heating and power purposes."

SECTION 1. Be it ordained by the common council of the city of Toledo, That, subject to the terms, conditions, and provisions of this ordinance, there is hereby granted to the Northwestern Ohio Natural Gas Company, its successors and assigns, the right of way along, through, and under the streets, avenues, lanes, alleys, and public places in said city for the purposes of laying, constructing, maintaining, and using and operating one or more lines of gas mains and branch pipes, with necessary feeders and service pipes, drips, and other devices necessary for the successful operation of said lines and pipes in the conducting, supplying, and delivering natural or produced gas to consumers thereof for heating and power purposes.

SECTION 2. Whenever such company or corporation shall desire to lay down, relay, or extend their gas pipes through any of the streets, alleys, avenues, or public places of said city application for that purpose shall be made to the city civil engineer of said city and permission therefor obtained in writing before making any excavation or doing any other work in that connection; and all excavations made and all work done under the power and authority conferred by this ordinance on the streets, alleys, avenues, and public places of said city shall be under the direction of the city
13 civil engineer and to the approval of said engineer and the common council of said city: Provided, however, that said company or corporation shall not make any excavation nor tear up the pavements for the purpose of laying any pipes in Summit street from Perry street to Elm street without permission being first granted therefor by resolution of the common council; but the said corporation may, under the direction of the city civil engineer, cross Summit street between the points aforesaid with their said pipes by tunnelling under said street in such manner as to not injure or affect the pavement of said street.

SECTION 3. Such company or corporation shall not open or encumber more of any street, avenue, alley, lane, or public place at any one time than may be necessary to enable it to proceed with advantage in laying such main feeder, connection, or service pipe, nor more than shall have been previously authorized by the permit in writing, obtained from the city civil engineer, nor shall said company or corporation permit any such street, alley, avenue, lane, or public place to remain open or encumbered for a longer period than may be reasonably necessary to execute the work for which the same

shall have been opened, nor without putting up and maintaining the necessary barriers and lights so as to effectually prevent occurrence of any accident in consequence of such opening or encumbering of such street, alley, evenue, or public place.

SECTION 4. Whenever such company shall open ground in any street, alley, avenue, or public place they shall forthwith, after laying such mains, pipes, &c., in the same, restore the pavement, sidewalk, and ground to a condition equally good as before and at their own expense; and said company shall, also at their own expense, put and keep any portion of the street, pavement, planking, or macadamizing removed by them for such purpose in as good condition as the same was before such work or removal, and shall
14 keep the same in as good condition for one year thereafter. If said company or corporation shall fail to do any of the work required by this section the same may be done by said city, and said company or corporation shall be liable for the costs thereof.

SECTION 5. Such company or corporation shall do no permanent injury to any street, sidewalk, alley, avenue, or public place or in any manner unnecessarily disturb or interfere with any water or gas pipes or any sewer now laid by said city or any other authorized person, company, or corporation; also said The Northwestern Ohio Natural Gas Company shall save the said city of Toledo harmless from any and all damages or injury which it may at any time incur by reason of any excavation that shall be made under this ordinance or by reason of conducting said natural gas through the streets, alleys, lanes, or public places in said city by said company or corporation or its use by said company.

SECTION 6. Whenever the common council of the city of Toledo shall determine to pave or otherwise improve any of the streets, alleys, lanes, or public places of said city, said company or corporation shall, if required so to do by ordinance of the common council, lay down their mains and service pipes in and along the property so to be improved at such time as the common council may direct.

SECTION 7. The Northwestern Ohio Natural Gas Company, its successors or assigns, shall make connections with the mains or branch lines and lay service pipes for furnishing natural gas to consumers adjacent to said lines who may desire to use the same, provided that in the opinion of the said common council the amount of gas consumed by such parties will justify the laying of said pipes and making such connections; said service pipe to be laid by said company to the curb line on all streets or avenues without expense to said parties desiring to use the same.

15 SECTION 8. Should said The Northwestern Ohio Natural Gas Co., its successors and assigns, neglect or fail to prosecute with all reasonable diligence the work of bringing natural gas to Toledo for the foregoing purposes and fail to furnish a reasonable supply of the same by October 1st, 1887, the franchises and privileges herein granted may be by a resolution, duly passed by said common council, declared forfeited and all rights hereby acquired shall then deter-

mine and cease. The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon. This ordinance and all rights herein granted shall be subject to any general ordinance or ordinances which may hereafter be adopted by the common council regulating the mode and manner of laying, relaying, and repairing the mains or pipes, conductors, connections, and drips, and the conducting of gas through the streets, lanes, alleys, squares, docks, and lands of said city not inconsistent with the provisions of this ordinance.

SECTION 9. That an ordinance entitled "An ordinance granting the Citizens' Natural Gas Company the right to lay and maintain gas pipes in the streets, alleys, and public places in the city of Toledo for heating and power purposes, passed November 16th, 1885, be, and the same is hereby, repealed.

Passed Sept. 6th, 1886.

Attest: H. D. STANDART, *City Clerk.*

Approved Sept. 7, 1886.

S. F. FORBES, *Mayor.*

I hereby certify that this ordinance was published in the Toledo Eve. Bee Sept. 13 and 14, 1886.

H. D. STANDART, *City Clerk.*

I hereby certify that the foregoing is a true and correct copy of an ordinance passed Sept. 6, 1886, and recorded in vol. 8, folio 219, General Ordinances of the City of Toledo.

G. H. COLE, *City Clerk.*

Toledo, Feb'y 27, 1889.

16 Afterwards, to wit, on the 31st day of May, A. D. 1889, there was filed in the clerk's office of said court the following answer, to wit:

Answer.

In the Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS, RICHARD C. FELLOWS, JULIA Coddington, Mary Hoyt, Edward H. Schell, Mary E. Schell, Florence A. Cragin, Jane H. Cragin, Elizabeth S. Cragin, Wallace C. Andrews, Theodore M. Towle, Robert Schell, Edward H. Schell, and James W. Fellows, Executors and Trustees of the Last Will and Testament of Augustus Schell, Deceased, and John B. Carson

vs.

WILLIAM T. WALKER, Auditor of the City of Toledo; James K. Hamilton, Mayor of said City of Toledo; George H. Cole, Clerk of said City; William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, and Clarence Brown, Gas Trustees of said City, and The City of Toledo.

} In Equity.

Joint answer of William T. Walker, James K. Hamilton, George H. Cole, William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, Clarence Brown, and The City of Toledo, defendants, to the bill of complaint of James W. Fellows *et al.*, complainants.

These defendants, now and at all times hereafter, reserving all manner of benefit and advantage to themselves of exception to the many errors and insufficiencies in said bill contained, for answer thereto, or unto so much or such parts thereof as these defendants are advised is material for them to make answer unto, answer and say:

They deny that the complainants bring said suit in behalf of a large number of non-residents of the State of Ohio who are
17 owners of and tax-payers upon a large amount, or any amount, of real estate situate within said city of Toledo; they deny that the complainants represent the interests of other parties, non-residents of the State of Ohio, in the matters set forth and complained of in their bill of complaint, and they deny that said complainants represent, or are authorized to represent, any persons, non-residents of the State of Ohio, other than themselves.

These defendants deny that the property so represented by said complainants amounts in the aggregate, as valued and asssessed upon the tax duplicate of Lucas county, Ohio, to upwards of one million dollars. They deny that said complainants represent about one-thirtieth of the grand aggregate duplicate valuation of the personal and real property of said city as assessed upon said duplicate for taxation. Defendants are not informed whether said complainants are owners of or tax-payers upon a large amount of real estate situate within said city, or whether complainants are the owners of

or tax-payers upon any real estate within said city, and they therefore deny that they are such owners and tax-payers and call for strict proof in that regard.

Defendants aver that they are informed and believe, and so charge the fact to be, that the complainants above named are not in truth and in fact the real parties in interest in this action, but that, on the contrary, the same is collusively brought and attempted to be maintained solely at the instance and request and for the use and benenfit of the Toledo Natural Gas Company and the Northwestern Ohio Natural Gas Company, and the stockholders in each and both of said companies. Said The Toledo Natural Gas Company and the Northwestern Ohio Natural Gas Company are corporations duly organized and existing under the laws of the State of Ohio and engaged in the business of transporting natural gas from the natural gas fields of Ohio to the city of Toledo, and of furnishing and supplying the same to the citizens of said city for public and private use and consumption.

Defendants are informed and believe, and so allege the fact to be, that said complainants caused said suit to be instituted solely at the instigation and upon the request of said companies, their stockholders and representatives; that said natural-gas companies, their stockholders and representatives, have undertaken and agreed
18 to furnish money for and to pay all expenses incurred by or incident to said litigation, including the counsel fees herein, for which complainants may be liable.

And defendants aver upon information and belief that said natural-gas companies and their stockholders are the real parties in interest herein, and have caused this suit to be brought in the names of and for the pretended benefit of the complainants herein improperly and collusively, for the sole purpose of creating a cause cognizable by this honorable court.

Defendants deny that said trustees have assumed or asserted that they have the right and authority to incur expense and liability and contract debts in the name and on behalf of said city without having funds appropriated and available for that purpose. They deny that they have incurred any liability, except such as is contingent upon the issue and sale of bonds and the appropriation of money for the payment thereof, and they contracted such contingent liability only for the purpose of incurring the preliminary expenses incidental to the organization of the board of trustees.

These defendants deny that said city of Toledo is the only city in the State of Ohio to which said act of the General Assembly in complainants' bill of complaint referred to is or can be applicable.

Defendants deny that the total duplicate valuation of all the property, real and personal, in the city of Toledo is less than thirty-two million dollars, and they deny that the total indebtedness of said city of Toledo now exceeds three and one-half million dollars.

Defendants deny that the taxation in said city is excessive, or that it is unreasonably heavy and burdensome; and they aver that the rate of taxation in said city, in comparison to the actual value of property subject to taxation, is much less than the rate of

taxation in other cities of similar size and condition, compared with the actual value of property subject to taxation in such cities; that the value of real estate upon the tax duplicate of said city of
19 Toledo was fixed and determined at the decennial valuation of real estate in said city in the year 1880, at which time said city of Toledo had a population of about fifty thousand inhabitants; but the present actual value of said real estate is very much in excess of the duplicate valuation thereof, and the actual burden of taxation in said city is therefore much less than appears from a comparison between the rate of taxation and the duplicate valuation of property.

While expressly denying that any material part of the indebtedness incurred in the construction of said pipe line, if the same shall be constructed, will ever be levied or assessed upon the property of complainants and the other tax-payers of said city, defendants aver that if the entire cost thereof should be assessed and charged upon the property standing upon the tax duplicate of said city the same would not constitute an unreasonable or unlawful tax or charge against said property. The bonds so authorized by the common council of said city of Toledo on the 29th day of April, 1889, in the aggregate $75,000, are made to run for a period of thirty years from the date of the issue thereof, bearing interest at the rate of four and one-half per cent. per annum, payable semi-annually; and defendants aver that long prior to the date of the maturity of said bonds the income to be derived from supplying such city and the citizens thereof with natural gas for public and private use and consmption will, as defendants believe, largely exceed the amount of bonds so authorized to be issued and the interest thereon and be more than sufficient to meet the obligations thereby incurred.

Defendants deny that if said pipe line is constructed said complainants or any of the citizens or tax-payers of said city will be taxed without receiving the benefit contemplated by said act, or that they will be taxed without receiving a benefit very largely in excess of the amount of taxation. They deny that it is necessary to pipe, or that such benefit will be conditioned upon the piping of most, if not all, the streets of said city ready to supply all of the citizens within said city with natural gas.

Defendants deny that it will cost from three to five million dollars to purchase and acquire the necessary territory to construct the line from without said city into said city and pipe the streets
20 of said city so as to supply such city and the citizens thereof with natural gas for public and private use and consumption; and they deny that it will require for the construction and completion of said work from two to three years of time. On the contrary, defendants aver that they are informed and believe, and so allege the fact to be, that said work can be constructed and completed within twelve months from the time the proceeds of such bonds shall be available for the purposes of said act. They aver, upon like information and belief, that said pipe line can be constructed from the gas fields tributary to Toledo, to and within said city of Toledo, for and within the sum authorized by act of January 22, 1889.

Defendants deny that if said city of Toledo should, in pursuance of the authority conferred by said act of January 22, 1889, construct said pipe line and supply gas to said city and its citizens, it would in any manner result in placing an unjust and inequitable burden upon the property-owners who do not use gas and whose property is unimproved, or that the result would be placing a large tax and assessment upon the many for the few. They deny that there is no present necessity, advantage, or benefit to the said city or its citizens to be derived from engaging in the enterprise contemplated by said act, and they deny that said enterprise is or will be peculiarly speculative. They deny that to engage in such enterprise will result in unnecessary, burdensome, and unjust taxation, or that the operation and effect thereof will be to violate the rule of equity in taxation, or that it will result in confiscating or appropriating private property without compensation, benefit, or advantage, or that it will cause irreparable or any injury to said complainants or to those in whose behalf this suit is pretended to be brought or to any other tax-payers of said city of Toledo.

Defendants aver that said The Northwestern Ohio Natural Gas Company and The Toledo Natural Gas Company were at the times mentioned in said bill of complaint granted the right to lay pipes in the streets of said city of Toledo to supply natural gas to said city and its citizens for the purpose of furnishing heat and power only;

21 that said gas companies have piped a portion of the streets of said city and are engaged in supplying gas to certain consumers along the streets so piped; but defendants deny that said gas companies have furnished or are furnishing natural gas to said city and its citizens in accordance with the terms and conditions imposed by said ordinance, or that they are supplying, or, with the lines as at present constructed, are capable of supplying, natural gas to all of the citizens of said city who desire to use the same, or that they are supplying or can supply to consumers, who are now using the same, gas in quantities sufficient for the purposes for which it is desired. They aver that said gas companies have in many instances failed and refused to be governed by the prices fixed by said ordinance, and that said gas companies have charged and are now charging many consumers a price largely in excess of the price authorized by said ordinance to be charged, and that by threats of refusing to furnish gas have compelled consumers in the city of Toledo to pay for gas so furnished at prices largely in excess of those authorized by said ordinance.

Defendants aver that, while under the provisions of the statutes of the State of Ohio the common council of said city is authorized to fix the maximum price which said gas companies may charge for gas so furnished to consumers in said city, such power is of no practical use or benefit in regulating the price of gas for the reason that said companies can at any time refuse to furnish gas at the prices so fixed and wholly abandon their business of supplying gas to said city and its citizens.

Defendants deny that said act of February 27, 1889, or any other act mentioned in the bill of complaint confers corporate powers upon

said city of Toledo by special act, or that the same creates and authorizes an unlawful and unjust discrimination against existing and vested rights, or that said act or any of the acts in said bill of complaint mentioned are in violation of any of the provisions of the constitution of the State of Ohio.

Defendants deny that the plan and purpose of said law is to furnish to certain parts of the said city gas at public expense to enable the owners of real estate therein to offer the same to manufacturers who might be induced thereby to locate on said real estate manufacturing establishments because of the inducement of cheap
22 fuel, which it is contemplated to offer them through said city pipe line, thus enabling said city of Toledo to lend its aid and credit to private enterprises and private interests and expend the public moneys for the benefit of private enterprises and purposes.

Defendants deny that the sole purpose and object of said act was to furnish fuel and heat to private citizens and corporations, and they deny that said municipality, if it issues the bonds provided for by said act, must meet and pay the interest and principal thereof by a general levy. They deny that the enterprise authorized by said act is purely speculative or that the same is uncertain or hazardous. On the contrary, defendants aver that the city of Toledo, as a municipal corporation and as the owner of numerous public buildings wherein the business of the corporation is transacted, and being charged with the duty of lighting and heating the same, and being also charged with the duty of lighting the public streets, highways, parks, and other public grounds of the city, will require and furnish for public use and consumption a large quantity of the gas so supplied if the purposes of said act shall be accomplished. There are located and established in said city of Toledo not only a large number of public buildings used for public educational purposes, fire-department purposes, market-house purposes, and other customary public uses, but also a large number of hospital, asylum, and other charitable institutions devoted to the relief of the poor, the aged, the infirm, and destitute persons; to all of which the city desires and may be required to furnish natural gas for the purpose of supplying light, heat, and power.

Defendants aver that the only reason why said city has no gas or land in which gas can be found and no leases, gas wells, or gas supply of any kind is because none of the bonds so authorized by the common council of the said city of Toledo have been sold, with the exception of the sum of $10,000, which sum is insufficient to purchase the territory necessary and sufficient to supply such city with gas. But defendants aver that said city of Toledo can obtain an ample supply of gas at a reasonable cost and within the amount authorized by the said act to be expended for that purpose, and that it can obtain lands in which gas can be found, and that it can secure leases, gas wells, and a gas supply adequate to meet all
23 the requirements of said city and sufficient to accomplish the purposes of said act; and they deny that said city will be compelled to explore and experiment for natural gas without any certainty of obtaining the same or with great uncertainty as to the

kind and duration thereof. Defendants aver that said gas territory is well defined; that the supply of gas is certain, and, as defendants are informed and believe, practically inexhaustible.

The public and private use and consumption of natural gas so to be furnished under the provisions of said act of January 22, 1889, will be of great public utility and benefit. The use and consumption of the same for purposes of light, heat, and power will result in a great public and private saving to the city of Toledo and the citizens thereof, and the piping of natural gas to said city, as contemplated by said act, will result in furnishing to said city and its citizens both public and private conveniences and advantages to such an extent as will cause a great increase in the population of said city and the value of the property thereof.

Defendants aver that the gas fields tributary to the city of Toledo are ample to furnish natural gas to said city in quantities sufficient for the purposes named. Said lands are located in proximity to and sometimes intermingled with lands producing petroleum, and said gas lands and oil lands are in many instances owned and controlled in a common interest, to be used for the purpose of producing oil or gas according as developments may warrant such use. The natural-gas territory tributary to Toledo is limited, and a large portion thereof is already controlled by persons and corporations engaged in the business of producing and supplying natural gas and oil, but, as defendants are informed and believe and as they allege the fact to be, there still remains sufficient natural-gas territory tributary to Toledo to supply said city with natural gas for public and private use and consumption; but defendants are informed and believe, and so charge the fact to be, that said The Northwestern Ohio Natural Gas Company and The Toledo Natural Gas Company, together with the Standard Oil Company, a corporation engaged in the development of natural gas and oil lands in Ohio, and particularly in the production of oil, have attempted and are attempting to secure the entire and absolute control of all the natural-gas
24 territory tributary to Toledo for the purpose of regulating the production and controlling the supply and price of natural gas within such territory.

Defendants are further informed and believe, and so charge the fact to be, that said Standard Oil Company, its stockholders and the persons chiefly in interest therein, are the stockholders and chief parties in interest and ownership in said The Toledo Natural Gas Company and The Northwestern Ohio Natural Gas Company, and that said Standard Oil Company in Ohio and said The Toledo Natural Gas Company and The Northwestern Ohio Natural Gas Company are owned and controlled in a common interest. The object and purpose of such common ownership and interest is to secure the entire control of said gas lands tributary to Toledo and to prevent the city of Toledo and its citizens from securing its supply of natural gas for public and private use and consumption except through the companies aforesaid.

And defendants aver that if said city of Toledo shall not be permitted to carry out the purposes of said act of January 22, 1889, and

furnish gas to said city and its citizens the said gas companies and the said Standard Oil Company will be able to and will secure a complete and absolute monopoly of said territory, and said city will be able to secure natural gas for itself and its citizens only upon the terms and at the prices and in quantities fixed by said companies, and thereby said city and its citizens will be deprived of the great benefits to be derived from the use of natural gas if said city shall not be permitted to furnish the same in accordance with the provisions of said act.

Defendants deny that the business of furnishing natural gas under said act can only be conducted by said city of Toledo out of moneys arising from the sale of the bonds authorized by said act or only to the extent of the bonds so authorized. They deny that said contemplated investment is designed for the purpose of enabling the owners of land or leases of territory which is undeveloped to have the same bored, investigated, and developed at public expense.

They deny that natural gas is only found in a limited territory within the State of Ohio or that the same is confined to a few counties in the western part of the State. On the contrary, defendants aver that natural gas is found in other territory in the State of Ohio besides that which is tributary to the city of Toledo, and that natural gas is in fact piped to other cities in said State from other gas fields in said State.

Defendants deny that said act of January 22, 1889, is or must in its operation be confined to the city of Toledo, and they deny that said law is an evasion of any provision of the constitution of the State of Ohio.

Defendants deny that it is intended or that the purpose of said act is to collect a tax from the tax-payers of the city of Toledo for the sole purpose of supplying cheap fuel for manufacturing and domestic purposes to those who are situated so as to make it profitable or advantageous to use or utilize the same. They deny that any taxes are to be exacted for any other than a public purpose, or that the purpose for which taxes are to be exacted, if at all, is not subservient to the public welfare. They deny that the purpose of said act is a private enterprise for private gain, or that the same is for the sole benefit and advantage of persons in such situation as to be enabled to take advantage of the fuel thus contemplated to be furnished them in their business or homes.

Defendants deny that there is no provision for the collection of any revenue from the proposed consumers of natural gas, or that there is no provision for selling the same, or that there is no provision for providing in any manner except by taxation on all property, both real and personal, of said city for the cost of building or operating and maintaining said line or paying for the necessary gas. On the contrary, defendants aver that there is ample provision in the acts referred to in said bill and other acts of the General Assembly of the State of Ohio now in force for the collection of revenue from consumers of said gas and for the sale of the same sufficient to enable said city to meet the entire indebtedness necessary to

be incurred for the construction of said line and the furnishing of gas under said act of January 22, 1889.

Defendants deny that there is no provision for the election
26 or the appointment of successors to said trustees, or that there is no provision for supplying or paying for any deficiency that may arise in the original or any additional cost of constructing or maintaining said line.

Defendants aver that on the 9th day of May, 1889, Charles F. Curtis; Dewey, Rodgers & Co., a partnership doing business in the city of Toledo and State of Ohio under the said firm name; Harry W. Ashley, Marcus V. Barbour, Jethro G. Mitchell, Gosline & Barbour, a partnership, for and on behalf of themselves and others, tax-payers of said city, too numerous to mention, commenced an action as plaintiffs in the court of common pleas of Lucas county, Ohio, a court of concurrent jurisdiction with this honorable court in the subject-matter of this litigation, against the defendants herein and each of them as defendants. The plaintiffs in said action so brought in said court of common pleas of Lucas county, Ohio, allege that they bring the same on behalf of themselves and a large number of others, tax-payers of said city, similarly situated, who, as said plaintiffs aver, are too numerous to mention therein by name or to make parties thereto specifically, but who are, as plaintiffs therein aver, the owners of and tax-payers upon a large amount of real and personal property situate in said city of Toledo and valued and assessed upon the duplicate of said city at over three million dollars or about one-tenth of the aggregate duplicate valuation of said city.

These defendants and each and all of them were on the 9th day of May, 1889, duly served with process in said cause so commenced in said court of common pleas, and said cause is now pending undetermined. Said plaintiffs in said cause so pending in said court of common pleas by said action so commenced present in said court the same controversy pertaining to the same subject-matter
27 as that presented by the complainants herein, and said plaintiffs in said cause so pending in said court of common pleas pray relief against these defendants in the same manner and for the same matters and to the same effect as complainants now pray by the bill filed herein; and these defendants aver that said cause heretofore and now pending in said court of common pleas of Lucas county, Ohio, presents for the cognizance of said court all the several matters and things presented to this court by the bill and answer herein.

And as to any other matter or things material for them to answer to and not herein sufficiently answered, avoided, or denied these defendants deny that the same is true, to the knowledge or belief of these defendants; all of which matters and things these defendants are ready to aver and prove as this court shall direct, and pray to be hence dismissed with their reasonable costs and charges in this cause most wrongfully sustained.

W. H. A. REED,
Solicitor for Defendants.

G. W. KINNEY,
CLARENCE BROWN,
Of Counsel.

UNITED STATES OF AMERICA, }
Northern District of Ohio. }

William T. Walker, one of the defendants above named, makes oath that the statements contained in the foregoing answer made as of his own knowledge are true, and those made on information and belief he believes to be true.

W. T. WALKER.

Sworn to before me and subscribed in my presence this 31st day of May, 1889.

HALLIE W. BROWN,
U. S. Cir. Court Com'r, N. D. O.

28 Afterwards, to wit, on the 1st day of June, A. D. 1889, there was filed in the clerk's office of said court the following replication, to wit:

Replication.

In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER, Auditor, &c., *et al.*, Defendants. } In Equity.

The replication of James W. Fellows, Richard C. Fellows, Julia Coddington, A. Cragin, Jane H. Cragin, Elizabeth S. Cragin, Wallace C. Andrews, Theodore M. Towle, Robert A. Schell, Edward H. Schell, and James W. Fellows, executors and trustees of last will and testament of Augustus Schell, and John B. Carson, complainants, to the answer of William T. Walker, James K. Hamilton, George H. Cole, William W. Jones, Abner L. Backus, John E. Parsons, Thomas H. Tracy, Clarence Brown, and The City of Toledo, defendants.

This repliant-, saving and reserving to *himself* now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insufficiencies of the said answer, for replication thereunto say that they will aver, maintain, and prove their said bill of complaint to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendants is uncertain, untrue, and insufficient to be replied to by these repliants; without this, that any other
29 matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things these repliants are and will be ready to aver, maintain, and prove as this

honorable court shall direct, and humbly pray as in their said bill they have already prayed.

E. D. POTTER, JR.,
STEVENSON BURKE,
DOYLE, SCOTT & LEWIS,
Complainants' Solicitors.

30 Afterwards, to wit, on the 1st day of June, A. D. 1889, there was filed in the clerk's office of said court the following affidavit of John Cummings, to wit:

Affidavit of John Cummings.

In the United States Circuit Court, Northern District of Ohio, Western Division. In Equity.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER, Auditor, &c., *et al.*, Defendants.
} Affidavit in Support of Application for Injunction.

THE STATE OF OHIO, }
Lucas County, } *ss:*

John Cummings, being duly sworn, says that he has been a resident of the city of Toledo, Ohio, for forty years last past and is a taxpayer in said city.

That the Northwestern Ohio Natural Gas Company is a corporation duly organized under the laws of the State of Ohio for the purpose of furnishing natural gas to consumers for fuel, heating, and lighting purposes in the several counties in Northwestern Ohio, including Lucas county, in which the city of Toledo is situated.

That a true and compared copy of the ordinance passed by the city of Toledo granting the right to said company to lay pipes in the streets, alleys, and public places in said city is hereto attached and marked Exhibit "A."

That the Toledo Natural Gas Company is a like corporation; and the said city of Toledo, at the same time that the council passed the ordinance aforesaid, passed a substantially similar ordinance granting the like rights and franchises to said The Toledo Natural Gas Company; that under and in pursuance of the said ordinance and in consideration thereof and the ordinance fixing the
31 price to be charged by said companies, hereinafter referred to, the said companies each laid a main from the gas fields owned by them respectively, some thirty-six to forty miles distant from Toledo, to said city of Toledo, and laid about one hundred miles of pipe in said city, and have been ever since September, 1887, and now are furnishing gas to the said citizens of Toledo for fuel and heating and manufacturing purposes at or under the prices named in said price ordinance.

That on the 9th day of July, 1887, the said city council of said

city passed an ordinance fixing the price of gas to be charged for the period of three years from the date thereof by said companies, and each of said companies filed with the city clerk of said city their written acceptance of the terms thereof, as provided by law; that the prices so fixed by said city council are found in the printed ordinance attached hereto and marked Exhibit "B."

And affiant says that he has been personally cognizant of the entire agitation of the question of the passage of the act of the Legislature authorizing the city of Toledo to issue the bonds named in the bill in this suit, giving the matter personal attention ever since said agitation commenced, and during the whole period has been personally advised and cognizant of the facts relating thereto; that there were a number of meetings of the legislative committees considering the question both in Columbus and Toledo, at which affiant was personally present; that he has read very nearly all, if not entirely all, of the newspaper discussion of the question both during the pendency of the act before the Legislature and the question before the people preliminary to their vote on the subject and since, and the uniform argument and statement before the Legislature and the people was that the passage of the act and the vote would enable the people to force lower prices out of the gas com-
32 panies than those fixed by the ordinance, or if the line was built it would enable the city to furnish cheap gas to manufacturing enterprises, thus offering special inducements to corporations and persons engaged in manufacturing business to locate in Toledo, because fuel would be furnished them free, or practically free, and also that the private consumer would be enabled to obtain gas of the city at cheaper rates than the gas companies could or would furnish it, because the entire property of the city, real and personal, improved and unimproved, would have to contribute to pay for it; and during all of said discussion before the Legislature and the legislative committees and the people no other public use or purpose to which it was proposed to apply said natural gas was ever suggested or talked of or discussed, to the knowledge of affiant.

Affiant says that the city of Toledo is the only city of the third grade of the first class in the State of Ohio; that affiant attaches hereto a map of the said city of Toledo, substantially correct, as he believes; that the population of said city was at the last Federal census about fifty-one thousand, and the present population, in the opinion of affiant, *and* is, he believes, in the neighborhood of ninety to one hundred thousand people; that the indebtedness of said city is now about three and one-half millions, and the total duplicate valuation of all real and personal property in said city about thirty-two millions, and the present rate of taxation on all real and personal property for general purposes 2 & $\frac{8}{10}$ cents on the dollar of said valuation.

Affiant says that the said gas companies now furnishing natural gas in said city are prepared and ready to furnish gas to the citizens thereof and to comply with section seven of the ordinance of said city of Toledo, marked Exhibit "A" and hereto attached, and

all other provisions of said ordinance and of the said ordinance fixing the price, and affiant knows this to be so.

33 Affiant says that all of the public buildings of Toledo, except a few outlying school-houses in remote parts of the city, are now supplied with natural gas by the existing companies under contracts, and the entire expense of all fuel and heating used by said city for all purposes does not amount to $9,632 *thousand dollars* per annum; that said city is now under contract for lighting all the streets of said city with electric light for the term of five years from Jan'y 1, 1889, a copy of which contract is attached hereto and marked Exhibit "C," and said natural gas is unfit and unsuitable for any illuminating purposes and no such use or purpose can be contemplated.

Affiant says that it is true that the complainants are tax-payers of the city of Toledo, owning property therein which is taxed for all purposes of city taxation, and that affiant knows of his own knowledge of other tax-payers, non-residents of Ohio, who are represented by said complainants in this suit, and who bring this suit to prevent the levy and collection of unjust taxes and to prevent their being forced into an unwilling partnership in the business of supplying fuel to customers.

Affiant refers to the report of the sinking fund trustees for the year 1888, dated April 13, 1889, and found in the report of the city auditor for 1888 as printed under the authority of the city for the debt of said city, showing the bonded debt to be $3,155,000, without street-improvement debts (see pages 203 and 204 of said report), and that the bonds for street improvements, as affiant is informed and believes, exceeds three hundred thousand dollars.

JOHN CUMMINGS.

Sworn to before me and signed in my presence this 1st
[SEAL.] day of June, 1889.

GEO. B. BOONE,
Notary Public, Lucas Co., O.

34 EXHIBIT A.

An ordinance granting to the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo for heating and power purposes, and repealing an ordinance entitled "An ordinance granting to the Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in the city of Toledo for heating and power purposes."

SECTION 1. Be it ordained by the common council of the city of Toledo, That, subject to the terms, conditions, and provisions of this ordinance, there is hereby granted to the Northwestern Ohio Natural Gas Company, its successors and assigns, the right of way along, through, and under the streets, avenues, lanes, alleys, and public places in said city for the purpose of laying, constructing, maintain-

ing, and using and operating one or more lines of gas mains and branch pipes, with necessary feeders and service pipes, drips, and other devices necessary for the successful operation of said lines and pipes in the conducting, supplying, and delivering natural or produced gas to consumers thereof for heating and power purposes.

SECTION 2. Whenever such company or corporation shall desire to lay down, relay, or extend their gas pipes through any of the streets, alleys, avenues, or public places of said city application for that purpose shall be made to the city civil engineer of said city and permission therefor obtained in writing before making any excavation or doing any other work in that connection; and all excavations made and all work done, under the power and authority conferred by this ordinance, on the streets, alleys, avenues, and public places of said city shall be under the direction of the city civil engineer and to the approval of said engineer and the common council of said city: Provided, however, that said company or corporation shall not make any excavation nor tear up the pavements for the purpose of laying any pipes in Summit street from Perry street to Elm street without permission being first granted therefor by resolution of the common council; but the said corporation may, under the direction of the city civil engineer, cross Summit street between the points aforesaid with their said pipes by tunnelling under said street in such manner as to not injure or affect the pavement of said street.

SECTION 3. Such company or corporation shall not open or encumber more of any street, avenue, alley, lane, or public place at any one time than may be necessary to enable it to proceed with advantage in laying such main feeder, connection, or service pipe nor more than shall have been previously authorized by the permit in writing, obtained from the city civil engineer; nor shall said company or corporation permit any such street, alley, avenue, lane, or public place to remain open or encumbered for a longer period than may be reasonably necessary to execute the work for which the same shall have been opened, nor without putting up and maintaining the necessary barriers and lights so as to effectually prevent occurrence of any accident in consequence of such opening or encumbering of such street, alley, avenue, or public place.

SECTION 4. Whenever such company shall open ground in any street, alley, avenue, or public place they shall forthwith, after laying such mains, pipes, &c., in the same, restore the pavement, sidewalk, and ground to a condition equally good as before, and at their own expense; and said company shall also, at their own expense, put and keep any portion of the street, pavement, planking, or macadamizing removed by them for such purpose in as good condition as the same was before such work or removal, and shall keep the same in as good condition for one year thereafter. If said company or corporation shall fail to do any of the work required by this section the same may be done by said city, and said company or corporation shall be liable for the costs thereof.

SECTION 5. Such company or corporation shall do no permanent

injury to any street, sidewalk, alley, avenue, or public place or in any manner unnecessarily disturb or interfere with any water or gas pipes or any sewer now laid by said city or any other authorized person, company, or corporation; also said The Northwestern Ohio Natural Gas Company shall save the said city of Toledo harmless from any and all damages or injury which it may at any time incur by reason of any excavation that shall be made under this ordinance or by reason of conducting said natural gas through the streets, alleys, lanes, or public places in said city by said company or corporation or its use by said company.

SECTION 6. Whenever the common council of the city of Toledo shall determine to pave or otherwise improve any of the streets, alleys, lanes, or public places of said city said company or corporation shall, if required so to do, by ordinance of the common council, lay down their mains and service pipes in and along the property so to be improved at such time as the common council may direct.

SECTION 7. The Northwestern Ohio Natural Gas Company, its successors or assigns, shall make connections with the mains or branch lines and lay service pipes for furnishing natural gas to consumers adjacent to said lines who may desire to use the same: Provided that, in the opinion of the said common council, the amount of gas consumed by such parties will justify the laying of said pipes and making such connections, said service pipe to be laid by said company to the curb line on all streets or avenues without expense to said parties desiring to use the same.

SECTION 8. Should said The Northwestern Ohio Natural
37 Gas Company, its successors and assigns, neglect or fail to prosecute with all reasonable diligence the work of bringing natural gas to Toledo for the foregoing purposes and fail to furnish a reasonable supply of the same by October 1st, 1887, the franchises and privileges herein granted may be by a resolution, duly passed by said common council, declared forfeited and all rights hereby acquired shall then determine and cease. The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon. This ordinance and all rights herein granted shall be subject to any general ordinance or ordinances which may hereafter be adopted by the common council regulating the mode and manner of laying, relaying, and repairing the mains or pipes, conductors, connections, and drips, and the conducting of gas through the streets, lanes, alleys, squares, docks, and lands of said city not inconsistent with the provisions of this ordinance.

SECTION 9. That an ordinance entitled "An ordinance granting the Citizens' Natural Gas Company the right to lay and maintain gas pipes in the streets, alleys, and public places in the city of Toledo for heating and power purposes," passed November 16th, 1885, be, and the same is hereby, repealed.

Passed Sept. 16th, 1886.

Attest: H. D. STANDART, *City Clerk.*

Approved Sep. 7, 1886. S. F. FORBES, *Mayor.*

I hereby certify that this ordinance was published in the Toledo Eve. Bee Sept. 13 & 14, 1886.

H. D. STANDART,
City Clerk.

I hereby certify that the foregoing is a true and correct copy of an ordinance passed Sept. 6, 1886, and recorded in vol. 8, folio 219, General Ordinances of the City of Toledo.

G. H. COLE, *City Clerk.*

Toledo, Feb'y 27, 1889.

38 EXHIBIT " B."

An Ordinance.

An ordinance fixing the price of natural gas to be charged by natural-gas companies in the city of Toledo for the period of three years.

SECTION 1. Be it enacted by the common council of the city of Toledo, That the natural-gas companies which have conducted their pipes and mains to or laid them in the city of Toledo, or which are conducting or laying or shall hereafter, during the term fixed in this ordinance, conduct or lay its pipes *and* to and in said city for the purpose of furnishing natural gas to the citizens of said city shall, for the period of three years from the passage of this ordinance, be entitled to charge for such gas furnished to the citizens and public buildings the prices named *and* the schedule hereinafter given, and that when said natural-gas companies or any of them shall file with the city its or their assent in writing to the terms of this ordinance, as provided in section 2479 of the Revised Statutes of Ohio, the said ordinance and acceptance shall be treated and deemed as a compliance with sections 2478 and 2479 of the Revised Statutes of the State of Ohio, and the said council shall not for the term aforesaid, by ordinance or otherwise, require said companies to furnish said gas at a price lower than that herein named: Provided that nothing herein contained shall be construed as granting to existing companies any exclusive rights or privileges or prevent any other company from furnishing natural gas to the citizens of said city.

SECTION 2. The schedule of prices hereinabove referred to is as follows:

Rates for hotel cooking made known after examination of the premises, but not to exceed the rates herein given.

The following rates will be charged for fuel gas:

For Cooking.

From November 1 to May 1.				From May 1 to November 1.			
	Monthly charges.	If paid before the 10th.			Monthly charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
No. 7 mixer	$2 78	.28	$2 50	No. 7 mixer	$1 66	.16	$1 50
No. 5 mixer	2 22	.22	2 00	No. 5 mixer	1 39	.14	1 25
No. 3 mixer	1 67	.17	1 50	No. 3 mixer	83	.08	75

For Large Cooking Range.

From November 1 to May 1.				From May 1 to November 1.			
No. 9 mixer	$3 33	.33	$3 00	No. 9 mixer	$2 22	.22	$2 00

For Laundry.

(When gas is furnished for cook stove also.)

	Monthly charges.	Discount.	Charges.		Monthly charges.	Discount.	Charges.
No. 7 mixer	$1 11	.11	$1 00	No. 5 mixer	.83	.08	.75

Manufacturers' rates for fuel shall be 75 per cent. of the cost of coal, and no more.

For Heating.

No. 7 Mixer.

	Monthly charges.	If paid before the 10th.			Annual charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
1st mixer	$5 00	.50	$4 50	1st mixer	$30 00	$3 00	$27 00
2d mixer	4 44	.44	4 00	2d mixer	26 64	2 64	24 00
3d mixer	3 89	.39	3 50	3d mixer	23 34	2 34	21 00
4th mixer	3 33	.33	3 00	4th mixer	19 98	1 98	18 00
5th mixer	2 78	.28	2 50	5th mixer	16 68	1 68	15 00
6th mixer	2 22	.22	2 00	6th mixer	13 32	1 32	12 00

No. 5 Mixer.

	Monthly charges.	If paid before the 10th			Annual charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
1st mixer	$3 89	.39	$3 50	1st mixer	$23 34	$2 34	$21 00
2d mixer	3 33	.33	3 00	2d mixer	19 98	1 98	18 00
3d mixer	2 78	.28	2 50	3d mixer	16 68	1 58	15 00
4th mixer	2 22	.22	2 00	4th mixer	13 32	1 32	12 00
5th mixer	1 66	.16	1 50	5th mixer	9 96	96	9 00
6th mixer	1 39	.14	1 25	6th mixer	8 34	84	7 50

No. 3 Mixer.

For heating small rooms and for special purposes.

	Monthly charges.	If paid before the 10th.	
		Discount.	Charges.
1st mixer	$2 22	.22	$2 00
2d mixer	1 66	.16	1 50

Furnaces.

	Monthly charges.	If paid before 10th.		Annual contracts.		
		Discount.	Charges.	Annual charges.	Discount.	Charges.
"A" mixer, 21-inch fire pot...	$6 95	$ 70	$6 25	$41 70	$4 20	$37 50
"B" mixer, 24-inch fire pot...	8 66	86	7 80	51 96	5 16	46 80
"C" mixer, 26-inch fire pot...	9 44	94	8 50	56 64	5 64	51 00
"D" mixer, 28 inch fire pot...	10 00	1 00	9 00	60 00	6 00	54 00
"E" mixer, 30-inch fire pot...	11 66	1 16	10 50	69 96	6 96	63 00
"F" mixer, 35-inch fire pot...	13 89	1 39	12 50	83 34	8 34	75 00

Passed July 5, 1887.

F. I. KING,
President Board of Councilmen.
P. H. DEGNAN,
President Board of Aldermen.

Attest: G. H. COLE, *City Clerk.*

(Here follows map marked p. 39.)

Contract for Lighting Parts of the City of Toledo with Electric Lights.

This agreement, made and entered into this 5th day of November, 1888, by and between the City of Toledo, party of the first part, and the Western Electric Light and Power Company, party of the second part, witnesseth:

First. That the party of the first part hereby grants to the party of the second part the right and privilege of erecting and maintaining all necessary poles, supports, wires, cables, lamps, or other appurtenances in and upon such streets, lanes, alleys, public grounds, bridges, and landings as shall enable said party of the second part to fulfill and carry out the terms of this contract; said poles, supports, wires, cables, lamps, and other appurtenances to be erected, subject to all ordinances governing poles and wires, and to the satisfaction of the city civil engineer and committee on gas or lighting.

2nd. This grant shall continue from the date of the approval of this contract until and including December 31st, 1893, subject to the conditions hereinafter contained, and to forfeiture and defeasance at the option of the party of the first part, in case said party of the second part shall not well and faithfully keep and perform all the covenants and conditions on its part to be kept and performed, as the same are herein contained.

3rd. Said party of the second part hereby agrees to erect and

maintain, at its own cost and expense, posts, wires, & lamps, with the necessary appurtenances and fixtures, at such points at the streets, ways, and bridges of the city as are specified in the schedule marked "B" and hereto attached, and at such other points in the city southwest of Jefferson St. and on the east side of Maumee river as the council may hereafter determine by ordinance within
41 the life of this contract, and said lamps shall be lighted and the lights extinguished each and every night in the year from and including January 1st, 1889, to December 31st, 1893, and said lamps shall be lighted from dusk in the evening until daylight in the morning, and said lamps shall be standard 2,000 candle-power arcs, of the system of the Western Electric Company of Chicago, and said lamps shall be suspended at the height of about thirty feet above the surface of the street where they are located.

4th. The party of the second part agrees to have said lamps named in the schedule attached erected and ready for use by January 1st, 1889, unavoidable delays excepted.

5th. In consideration of the faithful and entire performance of the foregoing stipulations by the party of the second part and a bond in the sum of five thousand (5,000) dollars guaranteeing the faithful performance of the same, the party of the first part hereby agrees to pay or cause to be paid to the said party of the second part for the lights herein provided for the sum of one hundred (100) dollars per lamp per year, and for lamps ordered during time covered by this contract at the same proportional rate; and it is further agreed that should any of the lamps furnished under this contract fail to burn during any part of the hours specified in this contract the party of the first part shall at the end of each month or oftener notify the party of the second part of the time of such failure, and a deduction of two and one-half ($2\frac{1}{2}$) cents per hour shall be made from the sum above stated for each and every lamp thus reported. The payment shall be made in the following manner to wit: For the lamps used at or in any of the public buildings of the city or any other lamps ordered by the city to be paid out of the general or any other regular fund, bills shall be rendered quarterly, and said bills shall be paid in cash, allowing a reasonable time for the pas-
42 sage of the claim ordinance in the regular routine of business, and for those lamps located on the various streets, the cost of which is to be assessed on the property abutting on the streets, the party of the second part shall on or before the tenth day of July of each year render bills to the city council for the sums then due on account of said lamps, and said sums shall be paid by valid assessments upon the lots and lands bounding and abutting on the streets lighted, which streets and their limits shall be defined in the ordinance providing for said lights. Said assessment shall be made payable to the auditor of the city of Toledo within ten days after the passage of the assessing ordinance; and in case said assessment or any part thereof shall remain unpaid at the expiration of said ten days said unpaid portion shall then be duly certified to the auditor of Lucas county, to be by him placed on the tax duplicate for collection.

6th. The party of the second part hereby expressly agrees to save harmless the city of Toledo from any and all damages, cost, and expense for which said city may become liable on account of any injuries or damages that may be sustained by any person or persons or corporation resulting from or on account of the right and privilege to erect and maintain posts, lines, lamps, cables, lights, &c., as granted in this contract; and in case such claim for damages shall at any time be made against said party of the first part said party of the first part shall notify said party of the second part in writing of such claim, and if said party of the second part shall not within ten days thereafter satisfy such claim or notify the party of the first part that it will defend at its own cost and expense any action which may be prosecuted on such claim and save said party of the first part harmless from all damages and expenses which may grow out of the same, the party of the first part may itself settle and
43 adjust such claims and shall have the right to recover of said party of the second part any sum of money it may have paid in such settlement or adjustment.

In witness whereof the parties have hereunto set their hands and seals the day and year first above written.

THE WESTERN ELECTRIC LIGHT AND POWER COMPANY,
By H. S. WALBRIDGE, *Vice-President.*

Confirmed by the common council of the city of Toledo by resolution adopted November 12th, 1888.

Attest: G. H. COLE, *City Clerk.*

Approved November 15th, 1888.

J. K. HAMILTON, *Mayor.*

I hereby certify that the foregoing is a true and correct copy of the original contract now on file in this office.

G. H. COLE, *City Clerk.*

44 *Bond.*

Know all men by these presents that we, The Western Electric Light and Power Company, by H. S. Walbridge, vice-president, & H. S. Walbridge and Chas. R. Fabin, Jr., as sureties, are held and firmly bound unto the City of Toledo, O., in the sum of five thousand (5,000) dollars; for the payment of which, well and truly to be made, we jointly and severally bind ourselves, our heirs, executors, administrators, or successors, firmly by these presents.

Witness our hands and seals this 5th day of November, A. D. 1888.

The consideration of this obligation is such that whereas the said The Western Electric Light and Power Company did, on the 5th day of November, A. D. 1888, by articles of that date, enter into contract with the city of Toledo to light certain parts of the city with electric lights for the prices in said contract stipulated:

Now, if the said The Western Electric Light and Power Company

shall well and faithfully in all things fulfill said contract and perform said work according to the same and within the time specified, then this obligation shall be void and of no effect, but otherwise it shall remain in full force and virtue.

THE WESTERN ELECTRIC LIGHT AND POWER COMPANY,
By H. S. WALBRIDGE, *Vice-President.*
H. S. WALBRIDGE,
CHAS. R. FABIN, JR., *Sureties.*

Copy of foregoing affidavit, with exhibits, served upon me this 1st day of June, A. D. 1889, at 3.45 p. m.

W. H. A. READ,
Solicitor for Def'ts.

45 Afterwards, to wit, on the 4th day of June, A. D. 1889, there were filed in the clerk's office of said court the following affidavits of William T. Walker, Lizzie King, Thomas R. Wickenden, George C. Metzger, Alphonso E. Rood, and W. S. Thurstin, to wit:

Affidavits of Wm. T. Walker et al.

In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS and Others, Complainants,
against
WILLIAM T. WALKER, Auditor of the City of Toledo, and Others, Defendants. } In Equity.

Affidavit against application for injunction.

STATE OF OHIO, *Lucas County,* } *ss:*

William T. Walker, being first duly sworn, deposes and says that he now is and for more than two (2) years last past has been the duly elected, qualified, and acting auditor of the city of Toledo, and that in his said capacity as auditor he has personal knowledge of the facts hereinafter stated.

Affiant says that for the year 1888 the said city of Toledo paid for lights and fuel as follows:

For general offices, lights	$426 26
For the police department, lights	751 43
For the police department, heating	471 86
Fire department, lights	598 52
Fire department, heating	623 45
Bridge department, lights	214 09
Bridge department, fuel	316 35
Memorial building, lights	269 38

Fuel bill for same has not been paid owing to dispute between the city and the company furnishing the fuel. The city claims the amount due to be $450. The company furnishing the fuel claim the amount to be $650.

46	Public library, lights	$178 00
	Public library, fuel	109 53
	Work-house, lights	103 44
	Work-house, fuel	1,321 25
	Election board, lights	18 10
	Election board, fuel	25 48
	Street commissioner's office, fuel	30 20
	Infirmary office, fuel	43 32
	City pound office, fuel	8 00
	Water-works department, lights	322 51
	Water-works department, fuel	3,999 96

Affiant says that the cost of said items for the year 1889 will not be less than the amounts given above.

W. T. WALKER.

Sworn to before me and subscribed in my presence this 3d day of June, 1889.

[SEAL.]

EBEN W. NEWTON,
Notary Public, Lucas County, Ohio.

47 *Affidavit of Lizzie King.*

In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS and Others, Complainants,
against
WILLIAM T. WALKER, Auditor of the City of Toledo, and Others, Defendants. } In Equity.

Affidavit against application for injunction.

STATE OF OHIO, *Lucas County,* } *ss:*

Miss Lizzie King, being first duly sworn, deposes and says that she is now and for more than a year last past has been assistant clerk of the board of education of the city of Toledo, and that she has personal knowledge of the facts hereinafter stated.

Affiant says that for the year ending August 31st, 1888, the school board of the city of Toledo paid for the heating of public-school buildings of the city of Toledo the sum of $5,497.80, and that for the year ending August 31st, 1889, the amount that will be paid for such purpose will not be less than the amount above named.

LIZZIE KING.

Sworn to before me and signed in my presence this the 3d day of June, 1889.

[SEAL.] EBEN W. NEWTON,
Notary Public, Lucas County, Ohio.

48 *Affidavit of Thos. R. Wickenden.*

In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS and Others, Complainants,
against
WILLIAM T. WALKER, Auditor of the City of Toledo, and Others, Defendants. } In Equity.

Affidavit against application for injunction.

STATE OF OHIO, *Lucas County,* } *ss:*

Thomas R. Wickenden, being first duly sworn, deposes and says that he now is and for more than two (2) years last past has been the duly elected, qualified, and acting city civil engineer, and that he has personal knowledge of the facts hereinafter stated.

Affiant says that under contract between the city of Toledo and certain electric-light companies the said electric-light companies are now furnishing to the city of Toledo, for the purpose of lighting the public streets, avenues, parks, bridges, and other public places of the city, not less than 430 electric lights, and that the city of Toledo is paying at the rate of $100 a year for each and every one of said lights.

THOMAS R. WICKENDEN.

Sworn to before me and signed in my presence this 3d day of June, 1889.

[SEAL.] EBEN W. NEWTON,
Notary Public, Lucas County, Ohio.

49 *Affidavit of Geo. C. Metzger.*

United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS & *al.*, Complainants,
vs.
WILLIAM T. WALKER, Auditor, & *al.*, Respondents. }

Affidavit of George G. Metzger.

THE STATE OF OHIO, *Lucas County,* } *ss:*

George G. Metzger, of lawful age, being first duly sworn, deposes and says that he is a member of the firm of Metzger Bros. & Co., a

partnership formed for the purpose of and doing business at the city of Toledo, in the State of Ohio, under said firm name.

That on or about the 4th day of December, A. D. 1888, the Toledo Natural Gas Company of Toledo, Ohio, entered into a written contract with said Metzger Bros. & Co., by which they agreed to furnish said Metzger Bros. & Co. with natural gas "for uses under boilers, for heating offices, and for illuminating through 21 five-foot burners for a sum aggregating seventeen hundred and twenty-two .22 dollars per year." A true copy of said contract is hereto annexed and made a part hereof and marked "Exhibit A."

That on or about said 4th day of December, 1888, said Metzger Bros. & Co. commenced using said natural gas so furnished under said contract for heating and illuminating purposes, and said firm has ever since said date continued to use the same and is now using the same for said purposes.

That they now have in use 21 burners for illuminating purposes using said natural gas, and said burners furnish a good and satisfactory light.

That the building in which the business of said firm is
50 conducted is about 84 feet in length and about 40 feet wide.

That said burners are the only lights used by said firm in and about said building and business and are sufficient to light the same.

GEORGE G. METZGER.

Sworn to before me and subscribed in my presence this 4th day of June, 1889.

I. I. MILLARD,

[SEAL.] *Notary Public, Lucas County, Ohio.*

51 EXHIBIT A.

Contract for the Supply of Gas.

This agreement, made and entered into this 4th day of December, 1888, by and between the Toledo Natural Gas Company of Toledo, Ohio, a corporation organized under the laws of Ohio, party of the first part, and Metzger Bros. & Co., of Auburndale, Ohio, party of the second part, witnesseth:

That, for and in consideration of the payments and covenants herein agreed to be made, kept, and performed by the party of the second part, the party of the first part hereby agrees to furnish gas to the said second party, and the said second party agrees to receive and pay the first party for the same until the first day of April, 1889, for the purposes and under the rates, terms, and conditions hereinafter mentioned and such other reasonable regulations as the party of the first part may adopt governing the use and supply of said gas.

And for such gas so supplied by said first party the said second party hereby agrees to pay the prices named in the schedule of rates

herein contained, said gas to be furnished for the following purposes only and at the following rates per month:

For gas fuel for use under boilers, for heating office, and for illuminating through 21 five-foot burners for a sum aggregating seventeen hundred and twenty-two .22 dollars ($1,722.22) per year, payable monthly in advance, in twelve installments, subject, however, to a discount of ten per cent. if paid on or before the tenth day of the month in which the bills become due.

No power or heat to be supplied to any other party without the written consent of first party.

It is distinctly understood that this contract covers the use of gas for no other purpose than above set forth.

52 It is also agreed that the entire gas supply in works of said second party shall be under the control and supervision of the superintendent of said first party, whose duty it shall be to guard against any waste of gas and see that the connections are arranged in a manner conducive to a correct and economical consumption of gas; to regulate the pressure to be carried, and have power to condemn any arrangement of the gas pipes which he may consider injurious to the interests of said first party and shut off the supply of gas from those pipes, provided he give said second party due notice of said intended action.

Said first party also further agrees to use reasonable care, effort, and diligence in furnishing sufficient gas for said purposes, but it is also mutually agreed and distinctly understood that in case the supply of gas should fail either partially or totally from any cause the said first party is not to be held liable for any damages resulting therefrom.

And, further, that the said first party is not to be held liable in any event, in any manner, shape, or form, for damages to person or property resulting from accident or occurring from such use of gas.

In witness whereof the parties hereto do execute this agreement as of the day and year first herein written.

THE TOLEDO NATURAL GAS COMPANY.
W. F. CRANE, *Sec'y.* [SEAL.]
METZGER BROS. & CO. [SEAL.]

Witness:

——— ———.

53 *Affidavit of A. E. Rood.*

United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS & *al.*, Complainants, *vs.* WILLIAM T. WALKER, Auditor, & *al.*, Respondents. } Affidavit of Alphonso E. Rood.

THE STATE OF OHIO, *Lucas County,* } *ss:*

Alphonso E. Rood, of lawful age, being first duly sworn, deposes and says that he is a resident of the city of Toledo, Ohio, and a member of the firm of Cray & Rood, doing business in said city as wholesale merchants; that for the years last past affiant's business has caused him to spend about one-half of his time at Marion, in the State of Indiana. Part of affiant's business for some time past has been the manufacturing of light for public and private use, and affiant is well acquainted with the subject.

Affiant says that since the discovery of natural gas at Marion, Indiana, said town has had its streets, public and private buildings lighted therewith, and when used with the most approved appliances makes a very brilliant, cheap, and serviceable light.

Natural gas is used in churches, stores, offices, and dwellings in said town of Marion and has been so used for over a year last past to the substantial exclusion of all other illuminants; and further affiant saith not.

ALPHONSO E. ROOD.

Sworn to before me and subscribed in my presence this 4th day of June, 1889.

[SEAL.] W. S. THURSTIN, *Notary Public, Lucas Co., Ohio.*

54 *Affidavit of W. S. Thurstin.*

United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS & *al.*, Complainants, *vs.* WILLIAM T. WALKER, Auditor, & *al.*, Respondents. } Affidavit of W. S. Thurstin.

THE STATE OF OHIO, *Lucas County,* } *ss:*

Wesley S. Thurstin, being duly sworn, on oath says that he has resided in the city of Toledo, Ohio, for over 20 years, and that for two

years last past he has been acquainted with the use of natural gas as an illuminant in the town of Bowling Green, the county-seat of Wood county, Ohio, and says that for that length of time natural gas has furnished the chief and, he believes, the only illuminant in the streets and public places in that town.

That at nights the streets in said town were better lighted with natural gas light than the streets of Toledo were with artificial gas light.

That in many of the private offices and stores of said town natural gas has been in use during said time for lighting purposes.

That affiant has observed such lights in use, the gas being used through an ordinary cleft gas fixture, with a lamp chimney to protect the flame from currents of air and to consume surplus carbon.

The lights so made were, so far as affiant could observe, substantially equal to the artificial gas as usually furnished.

Affiant has also observed a similar use of gas for lighting purposes in Findlay, the county-seat of Hancock county, Ohio.

Bowling Green is reputed to be a town of 2,500 and Findlay a town of about 15,000 population.

55 Affiant further says that John Cummings, of Toledo, Ohio, is in the employ of and reputed to be the vice-president of the Toledo Natural Gas Company.

W. S. THURSTIN.

Sworn to before me and subscribed in my presence this 4th day of June, 1889.

RICHARD M. McKEE,
[SEAL.] *Notary Public in & for Lucas Co., O.*

56 Afterwards, to wit, on the 4th day of June, A. D. 1889, there was filed in the clerk's office of said court the following copy of petition for injunction in case of Charles F. Curtis *et al. vs.* The City of Toledo *et al.*, to wit:

Petition for Injunction in Curtis vs. The City.

Court of Common Pleas, Lucas County, Ohio.

CHARLES F. CURTIS; DEWEY, RODGERS & Co., a Partnership Doing Business in the City of Toledo and State of Ohio under the said Firm Name; Harry W. Ashley, Marcus V. Barbour, Jethro G. Mitchell; Gosline & Barbour, a Partnership, for and on Behalf of Themselves and Others, Tax-payers of said City, Too Numerous to Mention herein, as Plaintiffs, Plaintiffs,

vs.

THE CITY OF TOLEDO, JAMES K. HAMILTON, Mayor; GEORGE H. Cole, Clerk; William T. Walker, Auditor, of said City, and William W. Jones, Abner L. Backus, John E. Parsons, Thomas S. Tracey, and Clarence Brown, Gas Trustees of said City, Defendants.

The plaintiffs bring this action in behalf of themselves and a

large number of others, tax-payers of said city, similarly situated and who are too numerous to mention herein by name or to make parties hereto specifically, but who are the owners of and tax-payers upon a large amount of real and personal property situated in said city of Toledo, valued and assessed upon the duplicate at over three millions of dollars or about one-tenth of the aggregate duplicate valuation of said city. Said Dewey, Rodgers & Co. are a partnership doing business in said city of Toledo and formed in said city under the firm name aforesaid. Gosline & Barbour are also an Ohio partnership doing business in the city of Toledo under that firm name.

57 The plaintiffs say that they are owners of property and tax-payers in the city of Toledo, owning and paying taxes upon both real and personal property in said city.

That said plaintiffs, on the — day of ——, 1889, made a written request upon W. H. A. Read, the city solicitor of said city of Toledo, to commence an action for the purpose of obtaining the relief herein sought, a copy of which notice is as follows, to wit:

TOLEDO, *May* —, 1889.

W. H. A. Read, city solicitor:

You are hereby requested to at once commence an action for the purpose of restraining the city council of the city of Toledo, the said city of Toledo, its officers and agents, from issuing or selling any bonds or incurring or authorizing any indebtedness under an act entitled "An act to authorize cities of the third grade of the first class to borrow money and issue bonds therefor for the purpose of procuring territory and right of way, sinking wells for natural gas, purchasing wells and natural gas works, purchasing and laying pipes, and supplying such cities with natural gas for public and private use and consumption," passed January 22, 1889, 86 Ohio Laws, 7, 8, & 9, and to prevent the gas trustees appointed under said act from incurring any indebtedness or expending any money or using any bonds issued under said act or for any of the purposes therein named, and to prevent the sinking fund trustees of said city from cashing or purchasing any bonds or supplying any of the moneys of said city or any moneys or securities in their hands as such trustees to said gas trustees or dealing in any manner with any bonds issued under such act, to restrain the mayor and clerk from signing or executing said bonds and the auditor from selling or delivering the same to any one or from advertising

58 the same for sale, the said law being invalid, and any moneys or bonds used for any of the purposes named in said act being unlawful and contrary to the constitution and laws of the State of Ohio, and unless you commence said action the same will be prosecuted by the undersigned as in such cases provided by the statutes of the State of Ohio in that respect enacted.

Which notice was signed by said plaintiffs in due form and presented to said city solicitor and by him endorsed in writing:

"Respectfully decline to act in accordance with request.
May 9, '89.

W. H. A. READ,
City Solicitor."

And plaintiffs aver that said William T. Walker is the auditor of said city of Toledo, and that said George W. Davis, T. W. Childs, Pliny Watson, E. W. Tolerton, and James Blass are the sinking fund trustees of said city. James K. Hamilton is the mayor of said city and George H. Cole is the clerk of said city.

That said city solicitor refused to comply with said request or to commence said action; wherefore these plaintiffs commence the same under the statutes of Ohio in such case made and provided and on their own behalf and on behalf of said city of Toledo and the tax-payers thereof.

And plaintiffs say that on the 22nd day of January, 1889, the General Assembly of the State of Ohio passed an act entitled "An act to authorize cities of the third grade of the first class to borrow money and issue bonds therefor for the purpose of procuring territory and right of way, sinking wells for natural gas, purchasing wells and natural gas works, purchasing and laying pipes, and supplying such cities with natural gas for public and private use and consumption," which act of the said General Assembly is found in the Session Laws of 1889, vol. 86, pages 7, 8, & 9.

And plaintiffs say that the mayor of said city of Toledo, on the — day of March, 1889, caused to be published the notice of
59 such election, as required by said act, in several of the newspapers of said city, that the question of authorizing the issue of said bonds would be submitted to said voters at the municipal election to be held on the following first day of April, 1889.

The municipal election in said city next after the passage of said act occurred on Monday, the first day of April, 1889, and at said election the qualified voters of said city of Toledo voted on the proposition of the authority to issue said natural-gas bonds, and the returns of said election show that more than sixty per cent. of those voting upon the proposition vot*ing* in the affirmative upon such proposition.

And thereafter and on the 12th day of April, 1889, the Governor of the State of Ohio appointed the trustees named in said act, to wit, Abner L. Backus, William W. Jones, Clarence Brown, John E. Parsons, and Thomas H. Tracy, and issued to said persons certificates of their said appointment or commissions, showing the appointment and the respective terms thereof.

That on the 27th day of February, 1889, the said General Assembly of the State of Ohio passed an act entitled "An act supplementary to chapter 3, division 8, title 12, of the Revised Statutes of Ohio," which act of said General Assembly is found in the Session Laws of 1889, vol. 86, pages 58 & 59, and has no other or *other* title than the one above expressed.

That since the appointment by the Governor of said trustees they have assumed to organize by the election of said William W. Jones

as president thereof, and have already and without any authority from the city council of said city of Toledo and without having funds appropriated for that purpose and before the city council had passed any ordinance for the issue of said bonds or any part thereof or otherwise determined that the said city shall issue the same or any part thereof incurred expense and liability and contracted debts in the name and on behalf of said city in various ways, assuming and asserting that they have the right and authority to do so and that said city of Toledo will be liable therefor and bound to pay the same out of the funds hereafter to be raised by taxation.

60

Plaintiffs say that the city of Toledo, Lucas county, Ohio, is the only city of the third grade of the first class in the said State of Ohio and the only city to which said act of the General Assembly is or can be applicable.

That said city of Toledo contains within its corporate limits over twenty-five square miles of territory and over two hundred and fifty miles of laid-out and established streets; that about one-quarter of the territory embraced in said city limits has not been laid out into lots or streets and alleys and is contained in large tracts of land undivided and not intersected by streets or alleys, and that not more than one-fifth of the balance of the territory in said corporate limits is built upon or occupied by houses or structures or by inhabitants; that the population of said city is about one hundred thousand, the population at the last Federal census being about fifty-one thousand people.

That the total duplicate valuation of all the property, real and personal, in said city of Toledo is less than thirty-two millions of dollars, and the total indebtedness of said city of Toledo now exceeds three and one-half millions of dollars, the present rate of taxation in said city being two cents and seven mills on every dollar of valuation of the real and personal property of said city in addition to all special taxes and assessments for sewerage, street lighting, improving streets, alleys, and public places, water pipes, and all other special purposes, aggregating hundreds of thousands of dollars annually — and assessed upon the improved and unimproved property of said city, making the necessary burden of taxation in said city as heavy as can be borne by its citizens and tax-payers.

61

And plaintiffs aver that the said city of Toledo is so improved and built upon that, while its population does not exceed the one hundred thousand as hereinbefore alleged, its inhabitants are scattered over a very large part of the entire area of the city, so that in remote parts of said city from the business center are found, in all directions, residents and tax-payers in large numbers who will, if the scheme of building the pipe line herein mentioned is adopted, be taxed therefor without receiving the benefit contemplated by said act, unless every portion of said streets of the city are piped ready to supply all of the citizens of said city of Toledo; that to purchase and acquire the necessary territory, if it can be had, build the line, and pipe the said streets of said city so as to enable the said city to

furnish the residents and citizens thereof with natural gas for fuel will cost from three to five millions of dollars, as plaintiffs are informed and believe and so charge the fact to be, and will require for its construction and completion from 2 to 3 years' time at the very leas; that long before the same could possibly be done, even if the city had the means and money to do it, the said city council will have the right, under existing law, to fix the price to be charged by the now existing companies at such a price as will be fair and just and furnish a fair and adequate return for the money invested, while for the city to engage itself in the business of furnishing the same at any price less than that which it might and may thus fix by ordinance for the existing companies will necessarily result in confiscating the property of those who do not use said gas, or whose property is unimproved, or who pay taxes on personal property, for the benefit of such of the tax-payers and residents of said city who are not tax-payers as are so situated as to enable them exclusively to take the benefit of the proposed cheap fuel.

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There is therefore no present necessity, advantage, or benefit to be derived from engaging in said enterprise or incurring the debt aforesaid, but the same is and will be wholly unnecessary and burdensome and unjust in its operation and effect, and necessarily will violate the rule of equality in taxation and the equivalent furnished for taxes imposed and a confiscation or appropriation of private property without compensation, benefit, or advantage, and cause great and irreparable injury to the plaintiffs and other tax-payers of said city.

And plaintiffs aver that there are now two private corporations, viz., the Northwestern Ohio Natural Gas Company and the Toledo Natural Gas Company, supplying the said city of Toledo and the citizens thereof with natural gas for fuel and heating purposes, having piped the same from the gas fields in Wood and Hancock counties to said city of Toledo and laid pipes in all of the populous streets of said city of Toledo, and are supplying all of the citizens of said city who want to use the same for fuel or heating purposes.

That on the — day of ——, 1886, the said city council of said city of Toledo passed an ordinance granting to said Northwestern Ohio Natural Gas Company the right to lay pipes in the said streets of the city and to supply said gas to its citizens, a true copy of which ordinance is found in the records of the ordinances of said city and will be filed herewith, and to which reference is here made the same as if the same was fully copied herein and at this point, and which ordinance gave to the said company the right, upon certain conditions complied with by said company and which constituted a consideration therefor, to lay and maintain pipes, regulators, fixtures, and machinery in the streets, highways, lanes, &c., of said city for the purpose of supplying gas to consumers, public and private, in said city, and to the terms of which the said company assented and agreed, and the same constituted a valid and existing contract with said city, in full force and effect, and under which said company and the other company hereinafter named have piped a large part of said city and incurred a very large out-

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lay and expense; and at the same time an ordinance, practically similar to the one above given, was granted to the said The Toledo Natural Gas Company, and under said ordinances the said companies have laid their main pipes from the said gas field, some thirty-six miles from the city, to the said city and have piped the streets of said city as aforesaid, and are furnishing said natural gas to private consumers for domestic purposes and to manufacturers for manufacturing purposes.

That on the 4th day of March, 1887, the said General Assembly of the State of Ohio passed an act entitled "An act to amend sections 2478 and 2491 of the Revised Statutes of Ohio," whereby the power was conferred upon the councils of said city of Toledo to fix the price to be charged to consumers for said natural gas so furnished by said companies, and which act of the said General Assembly will be found in the Session Laws of 1887 (vol. 84, Ohio Laws, page 39).

That said law only authorizes the city council to fix the price to be charged by natural or artificial gas companies and does not authorize said city council to fix the price or any price to be charged by said natural-gas trustees; but, on the contrary, the said act, passed Feb'y 27, 1889, entitled an "Act supplementary to chapter 3, division 8, title 12, of the Revised Statutes of Ohio," undertakes to make the said general law applicable to said natural-gas trustees, and, if it gives said trustees any power, authorizes them
64 to fix the price to be so charged to its consumers, thus conferring corporate power on said city of Toledo by special act exempting said city of Toledo from the operation of said general law of March 4, 1887, and creating and authorizing an unlawful and unjust discrimination against existing and vested rights and in favor of said natural-gas trustees and said city of Toledo in its contemplated business of selling gas for fuel to its citizens and public and private consumers, and said act is in violation of section one, article 13, of the constitution of Ohio.

That thereafter the said city council, by ordinance passed July 9th, 1887, did fix the said price to be so charged by said companies for the period of three years from the date of such ordinance, during which time said city council, in and by said ordinance, agreed that it would not require said companies (by ordinance or otherwise) to furnish said gas at any less price than named in said ordinance; and said companies filed their acceptance thereof in writing with the city clerk of said city, and said ordinance is now in full force and effect and in operation and a contract with said gas companies; and said natural-gas companies have now about one hundred miles of pipe laid in the streets of said city and supplying said gas therefrom; and said act is in violation of the provisions of sec. 28, article 2, of the constitution of the State of Ohio.

Plaintiffs aver that there is no natural gas to be procured at any nearer point to the said city of Toledo than a distance of over thirty miles from said city, and that the whole scheme and purpose of said law is to furnish to certain parts of the city gas at public expense to enable the owners of real estate therein to offer the same to

manufacturers who might be induced thereby to locate on said real estate manufacturing establishments because of the inducement of cheap fuel which it is contemplated to offer them
65 through said city pipe line, thus enabling the said city of Toledo to lend its aid and credit to private enterprises and private interests and to expend the public moneys for the benefit of private enterprises and purposes; that there is no provision in said law for the expenditure of any money for the purpose of extending said proposed gas line to the said citizens of Toledo beyond the said seven hundred and fifty thousand dollars, which sum is wholly inadequate to bring the gas from any known gas field to the city limits and wholly inadequate to pipe the streets of the city if the gas was within the city limits.

That the public agitation of said question, both before the Legislature in the passage of said law and in the city in advocating its adoption by the vote of the people, was based largely upon the inducements that could thus be offered by the city to outside private corporations and manufacturing enterprises to locate in the city of Toledo because of the aid and contribution that could be given them by the city in the way of cheap or free fuel at public expense.

And said law and the expenditure of the said public moneys and the issue of the said bonds is in conflict with article 8, section 6, of the constitution of the State of Ohio.

And plaintiffs aver that the business of furnishing fuel and heat to private citizens is not such a public purpose as will authorize the levy of taxes therefor, and said municipality, if it issues said bonds, will be required to meet and pay the interest and principal thereof by resort to taxation, and said bill provides for the said levy and collection of taxes for the purpose of paying said interest and principal in addition to all other taxes authorized by law.

That the proposed scheme of expending the moneys of the public and the tax-payers of said city is purely speculative and
66 is uncertain, conjectural, and hazardous; that said city has no gas and no lands in which gas can be found, and no leases or gas wells or gas supply of any kind, and will be compelled, if it resorts to the powers granted in said law, to explore, experiment, and expend a large amount of money in development, exploration, and experimenting in boring for gas without any certainty of obtaining the same, without any certainty, but great uncertainty, of quantity, duration, and supply, and without any knowledge, information, or reasonable expectation of being able to carry out or accomplish any of the purposes or objects of said law.

And said business can only be conducted by said city of Toledo or its said officers and trustees out of moneys arising from the sale of the bonds authorized by said act and only to the extent of said bonds thus authorized, wholly irrespective of whether the same is or will be adequate or sufficient therefor; and that said contemplated investmant is therefore purely speculative and is designed for the purpose of enabling the owners of lands or leases of territory which is undeveloped to have the same bored, investigated, and

developed at public expense without any certainty or reasonable probability of any adequate or sufficient return therefor.

And plaintiffs say that natural gas is only found in limited territory in the State of Ohio, confined to a few counties in the western part of the State, and cannot be found in or piped to any part of the State remote from such territory, and the attempted classification in said law of all cities of the third grade of the first class in said State is and must in its operation be confined to said city of Toledo, and said law — an evasion of sec. 26, article 2, of the constitution of Ohio, which provides that "all laws of a general nature shall have a uniform operation throughout the State, nor shall
67 any act except such as relates to public schools be passed to take effect upon the approval of any other authority than the General Assembly."

And plaintiffs aver that the collection of taxes from the tax-payers of the city of Toledo and those owning property therein, both resident and non-resident, for the purpose of supplying cheap fuel for manufacturing or domestic purposes to those who choose, or who are situated so as to make it profitable and advantageous to accept, use, or utilize the same, is in conflict with and violation of the provisions of the bill of rights in the constitution of the State of Ohio, and of sec. 19 of article 1 of said constitution, which provides that "private property shall ever be held inviolate, but subservient to the public welfare." The purpose for which said exaction of taxes is contemplated is not a public purpose or subservient to the public welfare, but is a private enterprise, for private gain, and, as before alleged, for the sole benefit and advantage of persons in such situation as to be enabled to take advantage of fuel thus contemplated to be furnished them in their business or homes.

That said law is otherwise invalid and void for many other good and sufficient reasons in law, among which are that the said law contains no provision for the collection of any revenue from the proposed consumers of said natural gas, if any should be found or furnished under said act, or for selling the same, or for providing in any manner, except by taxation on the whole property, real and personal, of said city for the cost of building or operating and maintaining said line or paying for the necessary gas which will have to be purchased to be supplied to consumers thereof through said line; no provision for the election or appointment of successors to said trustees, no provision for supplying or paying any deficiency that may arise at any time in the original, or any additional cost of constructing or maintaining the same.

68 But plaintiffs say that, notwithstanding the many things herein averred and the invalidity of said law, the said city council did, on the — day of April, 1889, pass an ordinance for the issue of seventy-five thousand dollars of said bonds, and the mayor of said city has signed said ordinance and has either signed or threatens to sign said bonds, and said George H. Cole, as such city clerk, also threatens to sign said bonds, and said defendants are proposing to advertise the same and turn over the proceeds thereof to said gas trustees for the purpose of being expended in the un-

lawful enterprise aforesaid and thus misappropriate the credit and monies of said city.

And the plaintiffs say that they are informed and believe, and so charge and aver, that said sinking fund trustees have passed a resolution providing for the purchase of ten thousand dollars of said bonds without the same being advertised or any of the provisions of said law or the general law on the subject of municipal bonds being complied with; and plaintiffs aver that sinking fund trustees have no power or authority to purchase bonds, or to use any of the monies in the sinking fund of said city for any such purpose; that none of said bonds have ever yet been issued, and not issued for any debt incurred or owing by said city or in refunding any part of the debt of said city, but are authorized and can be issued only under the provisions of said act and for the purposes and in the manner named in said act, and said contemplated action of said sinking fund trustees is unlawful and in violation of the law and trust created thereby.

Plaintiffs pray that a preliminary injunction may be granted herein restraining said City of Toledo, its officers and agents, from issuing any bonds or incurring any indebtedness or obligation of any kind under the provisions of said act or for any of the purposes therein named or contemplated, and restraining said
69 James K. Hamilton, mayor of said city, and George H. Cole, clerk of said city, from signing or executing any such bonds or obligations, and restraining said William T. Walker from advertising the same for sale, or delivering or attempting to deliver or sell any of the said bonds to any person or persons whomsoever, including the sinking fund trustees of said city; restraining said sinking fund trustees above named from taking or purchasing any of said bonds or using any of the public funds under their control for that purpose; and restraining said gas trustees above named from making or incurring any indebtedness of any kind, or spending any of the city's monies, or any bonds or proceeds of said bonds, for any of the purposes named in said act; and that upon the final hearing hereof the said injunction may be made perpetual, and all of the said defendants and their successors in office may be perpetually enjoined and restrained from doing any of the acts or things herein complained of and enumerated in the above prayer for a temporary injunction; that said law may be declared invalid; that all taxation of every kind for any of the purposes named in said act may be declared illegal and void, and that the said City of Toledo, its officers and agents, may be perpetually enjoined and restrained from levying or attempting to levy or collect any taxes upon the real or personal property of these plaintiffs, or either of them, or of any other tax-payer of said city for any or all of the purposes named in said act, or for paying the principal or interest of any bonds or other debt or obligation incurred or issued thereunder.

E. D. POTTER, JR.,
DOYLE, SCOTT & LEWIS,
HUNTSBERGER & ASHLEY,
Plaintiffs' Att'ys.

70 THE STATE OF OHIO, } ss:
Lucas County, }

James S. Rodgers, being duly sworn, says he is one of the plaintiffs above named; that the facts stated in said petition are true.

JAMES S. RODGERS.

Sworn to before me and subscribed in my presence this 9th day of May, 1889.

WM. A. MILLS,
Notary Public. [SEAL.]

Lucas Com. Pleas.

CHARLES F. CURTIS *et al.* }
vs.
THE CITY OF TOLEDO & *al.* }

Mr. Clerk:

Issue summons for each of the defendants named in the caption above. Endorse petition for injunction & equitable relief.

May 9, '89.

E. D. POTTER, JR.,
DOYLE, SCOTT & LEWIS,
Att'ys for Pl'ffs.

STATE OF OHIO, } ss:
Lucas County. }

I, J. P. Bronson, clerk of the court of common pleas within and for the county of Lucas and State of Ohio, do hereby certify the foregoing to be a true and correct copy of the petition filed in my office on the 9th day of May, 1889, in the above-entitled cause.

In testimony whereof I hereunto subscribe my name and [SEAL.] affix the seal of said court, at Toledo, this 8th day of February, 1890.

J. P. BRONSON, *Clerk.*

71 And afterwards, to wit, on the 4th day of June, A. D. 1889, there was filed in the clerk's office of said court the following copy of summons and sheriff's return in case of Charles F. Curtis *et al. vs.* The City of Toledo *et al.*, to wit:

Summons in Curtis vs. The City.

THE STATE OF OHIO, } ss:
Lucas County, }

To the sheriff of Lucas county:

You are commanded to notify the City of Toledo, James K. Hamilton, mayor; George H. Cole, clerk; William T. Walker, auditor of said city, and William W. Jones, Abner L. Backus, John E. Parsons, Thomas S. Tracy, and Clarence Brown, gas trustees of said city, that they have been sued by Charles F. Curtis *et al.* in the

court of common pleas of Lucas county, and that unless they answer by the 8th day of June, 1889, the petition of said plaintiff against them filed in the clerk's office of the said court such petition will be taken as true and judgment rendered accordingly.

You will make due return of this summons on the 20th day of May, A. D. 1889.

Witness J. P. Brownson, clerk of said court, and the seal thereof, at Toledo, this 9th day of May, A. D. 1889.

[SEAL.]

J. P. BRONSON, *Clerk*,
By N. HADNETT,
Deputy Clerk.

THE STATE OF OHIO, } ss:
Lucas County, }

Received this writ May 9th, 1889, and, pursuant to its command, I summoned on the same day the within-named defendant,
72 The City of Toledo, at 3.09 p. m. by delivering to J. Kent Hamilton, mayor, a true and certified copy hereof, with all endorsements hereon. I did also, on the same day, at 3.09 p. m., summon James K. Hamilton, mayor of Toledo, and at 3.01 p. m. George H. Cole, clerk of Toledo, and at 3.03 p. m. William T. Walker, auditor of Toledo, and at 3.19 p. m. William W. Jones, a gas trustee of Toledo, and at 3.18 p. m. Thomas S. Tracy, a gas trustee of Toledo, and at 3.20 p. m. Clarence Brown, a gas trustee of Toledo, by delivering to each of them a true and certified copy of this writ and of the endorsements hereon. I did also, on the 10th day of May, 1889, at 9.15 a. m., summon the within-named Abner L. Backus, gas trustee, and at 9.10 a. m. John Parsons, gas trustee, by delivering to each of them a true and certified copy hereof, with all endorsements hereon.

JOHN S. HARBECK, JR., *Sheriff*,
By W. H. HARBECK, *Deputy.*

Sheriff's fees:

Service and return	$1 50
Cop.	2 16
Mileage	1 80
Ex. services	$5 46

THE STATE OF OHIO, } ss:
Lucas County, }

I, J. P. Bronson, clerk of the court of common pleas, the same being a court of record within and for the county of Lucas and State of Ohio, do hereby certify that the foregoing is a true and correct copy of the summons issued May 9th, 1889, in cause No. 29591, Charles F. Curtis *et al. vs.* The City of Toledo *et al.*, and of the sheriff's return endorsed thereon, and filed May 20, 1889.

73 In testimony whereof I hereunto subscribe my name and affix the seal of said court, at the city of Toledo, this 4th day of June, 1889.

[SEAL.]

J. P. BRONSON, *Clerk*,
By N. HADNETT,
Deputy Clerk.

74 Afterwards, to wit, on the 10th day of June, A. D. 1889, there was entered on the chancery order book the following order denying application for preliminary injunction, to wit:

Order Denying Application for Preliminary Injunction.

Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*
v.
WILLIAM T. WALKER, Aud'r, *et al.* } Chancery, No. 922.

This cause, coming on for hearing this day before the Hon. Howell E. Jackson, circuit judge, at Nashville, Tenn., at chambers, on the application of the complainants for a preliminary injunction, was argued by counsel; on consideration whereof it is ordered that said application be denied; and thereupon, upon application, complainants have leave to amend their bill within 30 days.

Done at chambers, in the city of Nashville, Tenn., this 7th day of June, 1889.

HOWELL E. JACKSON,
Circuit Judge.

75 Afterwards, to wit, on the 29th day of June, A. D. 1889, there was filed in the clerk's office of said court the following amendment to bill, to wit:

Amendment to Bill.

United States Circuit Court, Northern District of Ohio, Western Division. In Equity.

No. 922.

To the judges of the circuit court of the United States for the northern district of Ohio, western division:

The said complainants named in the original bill filed in this cause, on leave of the court, now come and file this an amendment to said original bill and as a supplement thereto, and complain of the said defendants named in said original bill, and further allege and say—

That the matter in dispute in this suit is the sum of ($750,000) seven hundred and fifty thousand dollars and involves the validity of the issue and sale of the bonds described in said original bill filed

herein, amounting to the said sum of seven hundred and fifty ($750.000) thousand dollars.

Said complainants further say that since filing of the original bill herein the said city council of the said city of Toledo, on the — day of June, A. D. 1889, passed an ordinance providing for and directing the issue and sale of ($500,000) five hundred thousand dollars of said bonds, and the said mayor of said city has signed said ordinance and has either signed or is about to sign said bonds, and said George H. Cole, said city clerk, has also signed said bonds or is about to sign the same; and said defendants are proposing to sell and have advertised said bonds to said sum of $500,000, to be sold upon the 22d day of July, A. D. 1889, at the office of said
76 auditor of the said city of Toledo, for the purpose of raising money to be expended in the said enterprise and for the purposes set forth in said original bill.

Complainants further say that the tax commissioners of the city of Toledo, upon whom rests the power and authority, by virtue of the laws of the State of Ohio, to determine the amount of the tax levies to be levied annually within the city of Toledo, have voted that they would approve and authorize a levy of one and one-tenth ($1\frac{1}{10}$) mills on the dollar of all the taxable property within the said city of Toledo, in addition to the other levies for the year 1889, for the purpose of meeting the payments of interest, charges, and expenses arising out of the issue and sale of said bonds and to provide a sinking fund out of which ultimately to meet and pay the principal thereof.

That the said city of Toledo is about to make a levy of the said one and one-tenth ($1\frac{1}{10}$) mills, or the greater part thereof, upon all the taxable property within the said city for said purposes aforesaid.

Wherefore your complainants ask and pray as in their original bill asked and prayed for, and as fully as though the same were herein fully set forth, reference being made to said original bill therefor.

And your complainants ask all and singular the relief and remedies asked for as in said original bill contained, as fully as tho' the same were set forth herein, reference being made to said original bill therefor.

STEVENSON BURKE,
DOYLE, SCOTT & LEWIS,
E. D. POTTER, JR.,
Solicitors and of Counsel for Complainants.

77 UNITED STATES OF AMERICA, }
Northern District of Ohio, Western Division, } *ss:*

E. D. Potter, Jr., being duly sworn, says he is one of the solicitors of said complainants in said suit; that none of said complainants are now within said district or State, but absent therefrom, and for that reason affiant makes this affidavit. Affiant says he has read over and knows the contents of said amended and supplemental bill, and that the facts therein stated are true in substance and in fact.

E. D. POTTER, JR.

Sworn to before me and signed in my presence this 29th day of June, A. D. 1889.

GEO. B. BONE,
[SEAL.] *Notary Public, Lucas Co., O.*

78 Afterwards, to wit, on the 16th day of August, A. D. 1889, there was entered on the journal of said court the following order for leave to file answer, &c., to wit:

Leave to File Answer, &c.

JAMES W. FELLOWS *et al.*
v.
WM. T. WALKER, Aud'r *et al.*, } J. E.

In this cause it is ordered that the defendants have leave to answer the supplemental and amended bill herein within ten days, and that complainants are required to close their proof-in-chief herein on or before October 25, 1889, and that respondents are required to close their proof herein on or before November 25, 1889, and that complainants close their proof in reply on or before the first day of the next term of this court, and that this cause thereafter stand for hearing.

79 Afterwards, to wit, on the 26th day of August, A. D. 1889, there was filed in the clerk's office of said court the following answer to amendment and supplement to bill to wit:

Answer to Amendment & Supplement to Bill.

In the Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS and Others, Complainants,
vs.
WILLIAM T. WALKER, Auditor of the City of Toledo, and Others, Defendants. } No. 922. In Equity.

Joint answer of the defendants to the amendment to the original bill, and also supplement thereto, of the complainants.

These defendants, reserving all manner of benefit and advantage to themselves of exception to the many errors and insufficiencies in said amendment and supplement, by leave of this court heretofore granted make this their answer thereto, and say:

They deny, and say it is false and untrue, that the matter in dispute in this suit is the sum of seven hundred and fifty ($750,000.00) thousand dollars and involves the validity of the issue and sale of the bonds described in complainants' original bill filed herein, amounting to the said sum of seven hundred and fifty thousand ($750,000.00) dollars.

On the contrary, defendants aver that the matter in dispute in

this suit is the amount of any tax that may be levied on the property of complainants located within the city of Toledo on account of the carrying into effect of the act of the General Assembly of the State of Ohio of January 22nd, 1889, referred to in said complainants' original bill.

80 Wherefore these defendants pray to be hence dismissed with their reasonable costs and charges in this cause sustained.

W. H. A. READ,
Solicitor for Defendants.

CLARENCE BROWN,
G. W. KINNEY,
Of Counsel.

UNITED STATES OF AMERICA,
Northern District of Ohio, Western Division, } *ss:*

Willian T. Walker, one of the defendants herein, makes oath and says that the statements and allegations in the foregoing answer contained are true as he verily believes.

W. T. WALKER.

Sworn to before me and signed in my presence this 24th day of August, A. D. 1889.

HALLIE W. BROWN,
U. S. Cir. Court Com., D. N. O.

81 Afterwards, to wit, on the 16th day of September, A. D. 1889, the- was filed in the clerk's office the opinion of Hon. Howell E. Jackson, United States circuit judge, sixth circuit, sustaining the validity of the Toledo general-fund bonds, issued for natural-gas purposes:

U. S. Circuit Court, Northern District Ohio, Western Division.

JAMES W. FELLOWS *et al.*
vs.
WM. T. WALKER, Auditor, *et al.*

82 This is an action brought by Fellows and others, non-resident tax-payers of the city of Toledo, against the City of Toledo and its officers, to enjoin the defendants from executing and selling $75,000 of bonds issued by the city for the purpose of securing natural gas and piping the same to the city of Toledo, upon the ground that the act of the Legislature authorizing such issue is unconstitutional.

Application is made for a preliminary injunction.

Defendants urge that the bill fails to show necessary jurisdictional facts, in that it does not appear that any one of the complainants is interested to the extent of $2,000, and that different tax-payers cannot unite their several interests for the purpose of making up the jurisdictional amount. While the court is of the opinion that the

real subject-matter of controversy is the validity of the obligation incurred by the entire issue of $75,000 of bonds rather than the separate interest of each complainant therein, still the question is one of such doubt that the court does not now decide it, and prefers to express no opinion thereon at this time.

The application must therefore be decided upon the bill, answer, and affidavits. It should be said at the outset that the court has nothing whatever to do with the questions of the policy of such legislation or the manner of carrying out the same or the benefits to be derived by the corporation therefrom. These are questions for legislative discretion and determination. The question for this court to determine is simply whether the act in controversy was a proper exercise of constitutional legislative power. The constitutionality of the act is denied because it is said to be a special act conferring corporate powers; that it is special because the city of Toledo is the only city of the third grade of the first class in the State of Ohio, and the only city to which this act is or can be applicable.

But this objection cannot be sustained. It is well settled by authority in Ohio that the classification of municipal corporations is valid, and that legislation which is applicable to a class is general, although there may be at that time but one city in that class. The act in question is equally applicable to all cities of the third grade of the first class, whether now belonging thereto or hereafter coming into that category. The answer denies the averment of the bill, that Toledo is the only city of the State to which the act is or can be applicable, and it does not appear that it is the only city that is or can be a city of the third grade of the first class.

It is next insisted that the act is made to take effect upon the approval of some authority other than the General Assembly,
83 but the language of the act is otherwise. As a matter of fact, it is made to take effect and be in force from and after its passage. Moreover, it is an enabling act, designed for those cities which accept in the manner and upon the conditions specified, and and takes effect from the date of its passage. It stands upon the same basis precisely as general acts authorizing the creation of corporations.

The next and the main ground upon which the bill rests and the injunction is sought is that the supplying of municipal corporations and their citizens with natural gas is not a public purpose or use for which the taxing power which is necessarily involved can be properly exercised. It is urged that while the act authorizes the city to procure natural gas for its own use and for use in public buildings, etc. (which complainants concede would be a public use), that the main object and primary purpose of the act is to enable the city to supply its individual inhabitants with fuel for private use and consumption at a cheaper rate than they can obtain it from other sources; that such being, as complainants insist, the direct object and purpose of the act, the taxing power of the city cannot be constitutionally exercised for the attainment of such an object. In the first place, this is not, in the opinion of the court, a proper view to

take of the legislation. The court would not be justified from, a reading of the act, in saying which was the primary object and purpose of the act, even assuming (what the court does not admit) that the supplying of private individuals with gas is a purely private advantage. It could just as well be urged that the primary object of the bill is to furnish gas for the city and the city buildings, etc., and that the supplying of the citizens was merely incidental thereto as to urge that the primary object of the bill is to supply individuals, and that the furnishing of the city and city buildings, etc., is incidental. The act, upon its face, is not open to such splitting or subdivision. As a whole it stands on the same footing as legislation for furnishing water and illuminating gas. It calls for the exercise of only the same powers as are constantly exercised by municipal corporations in supplying the city and its citizens with manufactured gas for illuminating purposes and in furnishing water for public and private use.

But even conceding that the primary object of the act is to enable the city to supply its individual citizens with natural gas for fuel or illuminating purposes, the court is unable to say that the grant of such a power is in excess of the legislative authority. Unquestionably the Legislature may authorize a city to furnish light or facilities for transportation or water to its citizens with or without cost, as the Legislature or city may determine. So long as the act is for the benefit of the public or the entire municipality or all the citizens of the municipality it does not lose its character as an act for a public purpose so as to become private in the sense that prevents the exercise of the power of taxation.

The case of Loan Association *vs.* Topeka, 20 Wall., 655, is an illustration of an attempt to exercise the taxing power for a purely private purpose. The benefit was to one private individual; the bonds were issued to him by name; the aid was to him and his pri-
84 vate business alone; but here the benefits and the aid are to the city in its public, corporate capacity and to every inhabitant thereof equally and alike. The court is wholly unable to distinguish this act from those conferring power upon municipalities to acquire and operate gas works and water works, and in connection therewith to furnish gas and water to the individual inhabitants; and it is of no consequence whether this source of supply, either of gas or water, is wholly within or wholly without the corporate limits of the city. The question of public interest determines the question of right to supply gas and water and not the mere location of the works or source of supply.

In Walker *vs.* Cincinnati, 21 Ohio State, 14, and in Hamilton Gas Light and Coke Company *vs.* Hamilton, 37 Fed. Rep., 832, decided by the circuit court of the United States for southern district of Ohio, it has been settled that the Legislature of Ohio has authority under the constitution of that State to invest municipalities with such powers as are conferred by this act. Since the decision in Sharpless *vs.* Philadelphia it is no longer an open question whether municipalities may engage in enterprises such as the one contemplated by the act in question in this case.

The court does not undertake to define the line which distinguishes public from private uses, nor is it necessary or even possible to do so. It is enough to say that, in the opinion of the court, the act of January 22, 1889, authorizing the city of Toledo to issue bonds for natural-gas purposes, is clearly within the general scope of of legislative power, is for a public use and purpose, and is not in contravention of any of the provisions of the constitution. The court being of the opinion that the legislation is valid, it follows, of course, that the injunction applied for must be refused.

But even if these questions were open to doubt in the mind of the court it does not follow that complainants would be entitled to an injunction, because it does not necessarily follow that taxation will have to be resorted to for the payment of these bonds. The act provides that the revenues derived from the sale of gas are to be applied to the payment of principal and interest of the bonds, and these revenues may be sufficient to meet the bonds without resort to taxation.

Injunctions are not granted in cases like the present, except where complainants' rights are clear and where an injury more or less irreparable is likely to result to complainants unless the defendants are enjoined. In this case complainants' rights are not clear, and the injury likely to result to them is not shown to be irreparable or even serious. On the other hand, the allowance of an injunction would be attended with serious and possibly irreparable loss and damage to the city of Toledo.

Many other reasons might be given, but it is sufficient to say that the legislation in question is not open to the objections presented by the bill, and therefore complainants are not entitled to the injunction.

It is accordingly denied.

In Chambers, Nashville, Tenn., June 7, 1889.

85 Afterwards, to wit, on the 27th day of September, A. D. 1889, there was filed in the clerk's office of said court the following replication to answer to amendment and supplement to bill, to wit:

Replication.

In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER *et al.*, Defendants. } In Equity.

The replication of the complainants and each of them complainant to the answer of the defendants to the amendment to the bill and supplement to bill.

These repliants, saving and reserving to himself and themselves now and at all times hereafter all and all manner of benefit and advantage of exception which may be had or taken to the manifold insuf-

ficiencies of the said answer, for replication thereunto say that they will aver, maintain, and prove their said bill of complaint and amendment and supplement thereto to be true, certain, and sufficient in law to be answered unto, and that the said answer of the said defendants is uncertain, untrue, and insufficient to be replied to by this repliant; without this, that any other matter or thing whatsoever in the said answer contained material or effectual in the law to be replied unto and not herein and hereby well and sufficiently replied unto, confessed or avoided, traversed or denied, is true; all which matters and things this repliant is and will be ready to aver, maintain, and prove as this honorable court shall direct, and humbly prays as in his said bill he has already prayed.

STEVENSON BURKE,
E. D. POTTER, JR.,
DOYLE, SCOTT & LEWIS,
Complainants' Solicitors.

86 Afterwards, to wit, on the 30th day of November, A. D. 1889, there was filed in the clerk's office of said court the following stipulation as to taking testimony, to wit:

Stipulation.

Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Plaintiffs,
vs.
WILLIAM T. WALKER *et al.*, Defendants. } No. 922. In Equity.

Stipulation for taking testimony.

It is hereby stipulated and agreed between the parties hereto and their several attorneys that the testimony taken in this cause by either party may be taken before a notary public in short-hand, to be afterwards reduced to writing, upon two days' notice of the time and place of taking the same; that the signatures of the several witnesses to their respective testimony is hereby waived, and the notary public before whom the testimony is taken is authorized to sign the names of witnesses to their testimony.

It is further stipulated that the two days' notice above referred to shall not include Sundays nor a reasonable time to reach the designated place for taking testimony, and this stipulation shall not affect the questions of competency or relevancy of testimony nor the time of taking the same as fixed by the court.

Toledo, Ohio, Oct. 4, 1889.

DOYLE, SCOTT & LEWIS,
Att'ys for Plaintiffs.
E. D. POTTER, JR., *Att'y for Pl'ff.*
CLARENCE BROWN,
W. H. A. READ,
G. W. KINNEY,
Att'ys and Counsel for Defendants.

87 Afterwards, to wit, on the 8th day of January, A. D. 1890, there was filed in the clerk's office of said court the following stipulation, to wit:

Stipulation.

Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER *et al.*, Defendants. } No. 922. In Equity.

It is hereby stipulated and agreed between the parties hereto that since the taking of testimony in this case, to wit, on or about the 2nd day of January, 1890, the property known and referred to in complainants' evidence as "the Augustus Schell property," and being the property described and referred to in Exhibits "3," "4," and "7," attached to complainants' evidence-in-chief, was sold and conveyed to citizens and residents of the city of Toledo, Ohio, who are now the owners and in possession of the same, and that since the date of said conveyance the complainants, James W. Fellows, Richard C. Fellows, Julia Coddington, Mary Hoyt, Edward H. Schell, Mary E. Schell, Florence A. Cragin, Jane H. Cragin, Elizabeth S. Cragin, and Robert Schell, Edward H. Schell, and James W. Fellows, executors and trustees of the last will and testament of Augustus Schell, deceased, have not been the owners of or tax-payers upon said real estate.

January 8th, 1890.

DOYLE & SCOTT AND
E. D. POTTER, JR.,
Solicitors for Complainants.
W. H. A. READ,
City Solicitor.
G. W. KINNEY AND
CLARENCE BROWN,
Solicitors for Def'ts.

88 Afterwards, to wit, on the 15th day of January, A. D. 1890, there was entered on the journal of said court the following order of dismissal, &c., to wit:

Decree.

U. S. Circuit Court, Northern District of Ohio, W. D. In Chancery.

JAMES W. FELLOWS *et al.*
vs.
WILLIAM T. WALKER, Auditor, etc., *et al.* } No. 922.

This cause came on to be heard at this term upon the complainants' bill of complaint and amendment and supplement thereto, the defendants' answers to said bill and to said amendment and supplement, the complainants' replications to said answers, and upon

the exhibits, proofs, and stipulations of the parties, and upon the evidence, and was submitted to the court; and, upon the consideration thereof, the court, being now fully advised and satisfied in the premises, find that the equities of the case are with the defendants; that the statutes of the State of Ohio and the ordinances of the city of Toledo in said bill of complainant and in said amendment and supplement thereto mentioned are valid and constitutional enactments; that the purposes for which said bonds are authorized to be issued and taxation to be made are public purposes and within the scope and authority of municipal corporations of said State of Ohio.

It is therefore ordered, adjudged, and decreed that the complainants' bill of complaint be, and the same is hereby, dismissed for want of equity at the costs of the complainants, and that the defendants recover of the complainants their costs herein incurred, to be taxed.

89 And thereupon said complainants, by their counsel, prayed an appeal to the Supreme Court of the United States, which appeal is allowed upon the complainants giving bond in the sum of one thousand dollars, conditioned according to law.

89½ Know all men by these presents that we, John H. Doyle, James S. Rodgers, Emery D. Potter, Jr., and Alexander W. Scott, are held and firmly bound unto William T. Walker, auditor; James H. Hamilton, mayor; George H. Cole, clerk, and William W. Jones, Clarence Brown, Abner S. Backus, Thomas H. Tracy, and Jno. E. Parsons, natural-gas trustees of the city of Toledo, and the city of Toledo in the sum of one thousand dollars; to the payment whereof, well and truly to be made, we bind ourselves, our heirs, executors, and administrators, jointly and severally, firmly by these presents.

Sealed with our seals and dated this — day of June, in the year of our Lord one thousand eight hundred and ninety.

Whereas the above-bounden James W. Fellows and other complainants, being all of the complainants named in the bill of complaint, have appealed to the next Supreme Court of the United States from a decree of the circuit court of the United States for the northern district of Ohio, bearing date the 15th day of January, A. D. 1890, in a cause wherein the said James W. Fellows and others were complainants and the said William T. Walker and others above named, as obligors, were respondents:

Now, therefore, the condition of this obligation is such that if the above-named appellants shall prosecute their said appeal with effect and pay all such damages, costs, and expenses as shall be awarded against them as such appellants therein, then this obligation to be void; otherwise to remain in full force and effect.

JOHN H. DOYLE. [SEAL.]
JAMES S. RODGERS. [SEAL.]
A. W. SCOTT. [SEAL.]
E. D. POTTER. [SEAL.]

Sealed and delivered in presence of—

—— ——.

[Endorsed:] No. 922. In the circuit court of the United States for the northern district of Ohio. James W. Fellows *et al. vs.* Wm. T. Walker, auditor, *et al.* Appeal bond. Approved and filed June 30, 1890. M. W. Sanders, clerk.

90 *Notice to Take Depositions.*

(See Swan & S., page 560.)

THE STATE OF OHIO, *Lucas County,* } ss:

In the Circuit Court of the United States for the Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
against
WILLIAM T. WALKER *et al.*, Defendants. } No. 922.

The defendants will take notice that on Monday, the 7th day of October, A. D. 1889, the above-named complainants will take the depositions of George H. Bodette and sundry witnesses, to be used as evidence on the trial of the above-entitled cause, at the office of E. D. Potter, Jr., in the city of Toledo, county of Lucas, and State of Ohio, between the hours of two o'clock p. m. and six o'clock p. m. of said day, and that the taking of the same will be adjourned from day to day, between the same hours, until they are completed.

E. D. POTTER, JR., AND
DOYLE, SCOTT & LEWIS,
Attorneys for Complainants.

I acknowledge service of the above notice by copy this 4th day of October, 1889.

W. H. A. REED,
Attorney for Defendants.

Instructions for Taking Depositions.

(See Swan & Cr., pages 1042, 1043, and 1044.)

Begin with the caption on the next page.

The depositions may be taken by stating the facts in reply to questions first written down, or in the narrative form.

In Ohio they may be taken before a judge or clerk of the supreme court, common pleas, or probate court, or before a justice of the peace, notary public, mayor or chief magistrate of any city or town corporate, or master commissioner, or persons empowered by a special commission. Out of Ohio by a judge, justice, or chancellor of any court of record, a justice of the peace, notary public, mayor or chief magistrate of any city or town corporate, commissioner appointed by the Governor of Ohio to take depositions, or any person authorized by a special commission.

If there are adjournments they should be noted by the magistrate or other officer from day to day at the close of the day.

Objections to questions or answers claimed to be illegal, or to witnesses claimed to be incompetent to testify, should be entered by making a short note of such objection.

Each witness must sign his own deposition.

The notice must be attached to the depositions and inclosed with them.

The depositions must be commenced on the day named in the notice, and some portion of a deposition taken on each successive day, Sundays excepted, adjournments being from Saturday to Monday, Sundays and national holidays not being regarded.

When depositions are taken under an agreement, the above instructions will be followed, except where they are modified by the agreement. In such cases the agreement must be followed. It should be attached to the depositions and referred to in the caption, as the notice is when taken under a notice.

If taken by the interrogatories and cross-interrogatories, under agreement or otherwise, every interrogatory and cross-interrogatory must be put to each witness, and answered so far as he can answer it, and the answer be written down. The deposition must show that each interrogatory and cross-interrogatory was thus put and answered.

The fees for taking depositions should be taxed and a memorandum thereof made below the certificate.

Depositions taken before a mayor, notary public, or commissioner appointed as aforesaid must be certified under his official seal. If before any of the other officers named above, a certificate must be annexed under the seal of the court of the county, or the great seal of the State, that the officer before whom the depositions were taken was at the time of taking the same such officer as he represents himself to be in his certificate. But if depositions are taken within this State by an officer having no seal, or if taken within or without this State, under special commission, it shall be sufficiently authenticated by the official signature of the officer or commissioner taking the same, and no other or further act of authentication shall be required.

This proof of official character is omitted when waived by agreement of the parties.

The whole should be sealed up by the magistrate, the title of the suit endorsed on the outside, the name of the officer taking the same, and "Deposition on behalf" (the party taking the same), and addressed to the clerk of the court where the suit is pending. Let the magistrate also endorse: "These depositions sealed up, addressed, and transmitted by me," and sign his name to such endorsement.

91 *Caption.*

Depositions taken before me, —— ——, a — within and for the county of ——, in the State of ——, pursuant to the annexed notice,

at the time and place therein specified, to be read in evidence on behalf of the — in an action pending in the — in and for — county, in the State of Ohio, in which —— —— plaintiff and —— —— defendant.

Present: —— ——, on behalf of the plaintiff, and —— ——, on behalf of the defendant.

—— ——, of lawful age, being by me first duly sworn, as heretofore certified, deposes and says as follows:

1st question by —— ——. State your name, age, occupation, and place of residence.

Answer. My name is —— ——. I am — years of age. I am a — by occupation, and I reside in —.

92 *Certificate to Depositions.*

(See Swan & Cr., page 1043, sec. 351.)

THE STATE OF OHIO, } ss:
—— *County,* }

I, —— ——, a — in and for the county and State aforesaid, duly commissioned and qualified, do hereby certify that the above-named —— —— were by me severally sworn to testify the truth, the whole truth, and nothing but the truth, and that the depositions by — respectively subscribed, as above set forth, were reduced to writing by —— ——, he being a proper person and not interested in the suit, in my presence and in the presence of the witness- respectively, and were subscribed by said witness- in my presence, and were taken at the time and place in the annexed notice specified, and continued from day to day as set forth.

I do further certify that I am not counsel, attorney, or relative of either party or otherwise interested in the event of this suit.

In witness whereof I have hereunto set my hand and seal of office, this — day of ——, A. D. 18—.

—— ——,
——.

Cost Bill.

Writing depositions, at 20 cts. per 100 words	*$99 00
Issuing subpœnas, 50 cents each	1 00
Swearing witnesses, 4 cents each	92
Certifying depositions, 25 cents	25
Clerk's certificate, 50 cents	
Postage	
	$101 17

* S. & S., page 367, third line below.

Constable's fees:

Service of 18 subpœnas	$1 95
Mileage on subpœna	
	$103 12

Witness fees:

75 cents per day and 5 cents traveling fees if more than 3 miles *

Total cost of taking depositions $103 12

Received of E. D. Potter, Jr., complainants' counsel, the sum of $103.12, in full of all fees as above specified.

The witnesses were paid their fees by —— ——.

EDWARD H. SMITH,
Notary Public.

93 Afterwards, to wit, on the 29 day of October, A. D. 1889, there was filed in the clerk's office the following deposition, to wit:

In the Circuit Court of the United States for the Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
against
WILLIAM T. WALKER *et al.*, Defendants.

Depositions taken before me, Edward H. Smith, a notary public within and for the county of Lucas, in the State of Ohio, pursuant to the annexed notice, at the time and place therein specified, to be read in evidence on behalf of the complainants in an action pending in the United States circuit court for the northern division of Ohio, western division, in which James W. Fellows and others are complainants and William T. Walker and others are defendants.

Present: E. D. Potter, Jr., Esq., on behalf of the complainants, and Guy W. Kinney, Esq., on behalf of the defendants.

This testimony is taken by the complainants before me on stipulation that the same may be taken in short-hand and afterwards reduced to typewriting, and the signatures of the witnesses thereunto are waived.

GEORGE H. BODETTE, of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says as follows:

Direct examination by Mr. E. D. POTTER, Jr.:

1 Q. State your name, age, place of residence, and occupation.
A. My name is George H. Bodette; I am thirty-seven years,

* See Swan & Cr, page 630.

past, of age; I am a civil engineer by occupation, doing business at rooms Nos. 1 and 2, Drummond block, Toledo, Ohio.

2 Q. How long have you lived in Toledo?

A. Ever since I was born.

3 Q. What official position have you occupied under the municipal government, if any?

A. I was city civil engineer.

4 Q. How long were you city civil engineer?

A. From about the first of April, 1881, to the first of May, 1883.

5 Q. How long have you been an engineer?

A. I started at engineering in 1872.

6 Q. In your position as engineer for the city—as civil engineer—and in your profession, to what extent are you familiar with the city—its extent and general improvements?

A. Whatever would come under the head of civil engineering.

94 7 Q. Whether you have had occasion to go over the city from time to time and its streets and observe and know the extent to which improvements have been made through the extent of the city.

A. I have; yes, sir.

8 Q. Have you made any calculations or estimate on the mileage of the streets within the city of Toledo?

A. I have made no complete calculation.

9 Q. Take it of the area of the city in miles first.

A. When Mr. Thatcher was engineer Mr. Thatcher and I made a calculation of the number of square miles in the city.

10 Q. When was that?

A. I think just about the last annexation proceedings were going on we made it for Mr. Segur (then a member of the council), which has never been superseded.

11 Q. That was based on the same boundary line which now exists?

A. Yes, sir.

12 Q. In round numbers, what is the superficial area?

(Objected to on the part of the defendants as being irrelevant and immaterial.)

A. Twenty-one and one-half square miles.

13 Q. I wish you would state as near as you can from any estimate you may have made as to the extent of the streets, in miles, within the city.

(Objected to on behalf of the defendants as irrelevant and immaterial.)

A. That was the calculation that I said I hadn't completed. I have carried them so far as to make over three hundred miles of streets.

14 Q. Can you tell us what proportion of that is on the east side of the Maumee river and that which is on the west side?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Six and two-tenths miles on the east side and fifteen and three-tenths on this side—the west side.

15 Q. From the centre of the population of the city what is the radius to the city boundaries?

(Objected to on behalf of defendants as irrelevant and immaterial.)

A. I couldn't state that now.

16 Q. Where is the centre of population?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. It has been changed to different places. I believe they now take the corner of Cherry and Summit streets as the centre.

17 Q. Starting, say, from the intersection of Summit street with Cherry street, take it south, east, west, and north, what would be the radii extending to the city line?

(Objected to on behalf of the defendants as irrelevant and immaterial.)

A. South, it would be 13,400 feet, a trifle over two miles; east, it would be 13,200 feet; west, it would be 14,400 feet, and north, would 11,200 feet.

18 Q. What is the present generally estimated population of the city?

(Objected to on behalf of the defendants as being irrelevant and immaterial.)

A. I should say, taking the directory and counting the names and allowing two and one-half to a name, it would figure about ninety-two thousand (92,000).

95 19 Q. Does this estimated superficial area include Maumee river?

A. No, sir.

20 Q. About what is the dock frontage?

(Objected to on the part of defendants as being irrelevant and immaterial.)

A. A trifle over seventeen miles.

21 Q. Within the city limits?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Yes, sir.

22 Q. That includes both sides of the river?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Both sides of the river and both sides of Swan creek and the bayou.

23 Q. Have you made any examination, or from any knowledge or investigation that you have made or had can you give us any estimate of what proportion of property within the city is improved and unimproved—I mean built up either for business houses or dwelling purposes or manufacturing purposes?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. I took the duplicate of Port Lawrence lands inside of the city and made some calculations, which would lead me to think that over one-half of the city is what you would call unimproved property. Of course you take a lot large enough to put three houses on it and only one is standing on it, why it would be more, but I am taking the lots as improvements are shown on them; it wouldn't make any difference how big the lot was; if it had an improvement on it I would consider it as improved property, and I think it is not over one-half of the area of the city.

24 Q. The residences within the city limits, how is it as to their being confined to one limit or distributed and scattered?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. They are distributed.

25 Q. Will they be found in the vicinity of the city boundaries—the residences?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Well, Toledo is always noted as being a city of beautiful distances.

26 Q. Have you made any computation or any estimate as to the duplicate valuations of the property within the city?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Not since I was in the engineer's office. I then had occasion to look it up.

27 Q. Can you give an estimate of what proportion—that is, an estimate of the relative proportion that the duplicate valuation of unimproved property would bear to that of the improved portions of the property?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. No; I don't think I could, Mr. Potter. I should judge about one-third; that is not from any calculations or figures. From my opinion, I should think it would be about one-third.

28 Q. And your opinion is based upon what?

A. Oh, I judge from a knowledge of the town and the ac-

quaintance I have with values and the duplicates, and the like of that.

96 29 Q. Do you know what the city duplicate valuation is in round numbers?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Not from personal inspection; I think it runs thirty millions. In 1883 it was twenty-seven millions and past.

30 Q. Do you know what the municipal rate of taxation was last year?

(Objected to on the part of defendants as being irrelevant and immaterial.)

A. Two and eighty-one hundredths dollars upon one hundred dollars.

Cross-examination by Mr. KINNEY:

1 Q. When was it you made the investigation from which you have calculated that over one-half of the area of the city of Toledo is unimproved property?

A. I made that last fall, and went over a portion of it again—partly Saturday and part this morning.

2 Q. What did that investigation consist of?

A. At the time I went over it it consisted of this: I took the duplicate of the Port Lawrence lands, took the number of acres of it, and then I took each addition as I ran through and found out what part of it was in the name of the man who laid out the addition. I then went to the auditor's office and took the books and saw what improvements had been placed upon this property. Where it was an old addition I took the last decennial books—the books of 1880; then I looked over the additions, and then I went over—partially Saturday and partially to-day—the same thing to see if there had been any large changes—that is, large tracts of land laid out in additions. There has been quite a number, but the changes, I don't think, are enough to change my opinion that it is over one-half unimproved, and if you were to take the basis of thirty feet as a lot it is considerably more than one-half; it is fully three-fifths.

(The further taking of depositions under the annexed notice was adjourned to Tuesday, October 8, 1889, at the same place, at the hour of 10 a. m.)

97 ROOM NO. 12, DRUMMOND BLOCK,
TOLEDO, OHIO, *Oct.* 8, '89.

The further taking of depositions under the notice attached was resumed at 10 a. m.

Present: E. D. Potter, Jr., Esq., representing complainants, and G. W. Kinney, Esq., representing defendants.

WILLIAM T. WALKER, called on the part of complainants, a witness of lawful age, being first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. POTTER:

1 Q. State your name, age, residence, and occupation.

A. William T. Walker; sixty-four years of age; auditor of the city of Toledo, and resident of Toledo.

2 Q. How long have you been auditor?

A. Since 1886—between three and four years.

3 Q. And as such auditor what, generally, are your duties and over what have you charge?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. I have charge of the financial interests of the city and of the books in relation thereto.

4 Q. Showing the bonded indebtedness?

(Objected to on the part of defendants as being irrelevant and immaterial.)

A. Yes, sir—that is, so far as the issuing of the bonds and the examination of the reports of the sinking fund commission.

5 Q. In round numbers, can you state *can you state* what the present bonded municipal debt of the city of Toledo is?

(Objected to on the part of defendants on the ground of irrelevancy and immateriality.)

A. Yes, sir; it was $3,155,000 on the first of January, 1889; since that there was a reduction of $198,000 and an addition of $190,000, which would reduce it $8,000, and a debt of $75,000 for natural-gas purposes; that is $67,000 added.

6 Q. Making, in round numbers, the present bonded debt of the city $3,222,000?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Yes, sir; that is, of course, independent of the amount of the sinking fund, which is usually deducted from those amounts.

7 Q. What amount, in round numbers, is now in the sinking fund?

(Objected to as irrelevant and immaterial on the part of defendants.)

A. There is over $150,000.

8 Q. Are those moneys the proceeds of bonds sold?

(Objected to on the ground of irrelevancy and immateriality by defendants.)

A. No, sir—well, they are something that way. In the first place there is a sinking fund tax of one mill on the dollar that is col-

lected regularly; then they have moneys arising to the sinking fund for interest or otherwise. When it amounts to $10,000 it is invested in certificates or improvement bonds; is invested, and the interest is constantly coming in, and the tax of one mill on the dollar.

98 9 Q. Is there any fund now in the hands of the sinking fund commission?

(Objected to by defendants as irrelevant and immaterial.)

A. There must be, from those facts, but I don't know of my own knowledge.

10 Q. Then the extent of the investments by the sinking fund commissioners you know nothing about?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Nothing, only from their reports.

11 Q. Can you tell us what is the rate of interest on this bonded debt? Is there any difference?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. There is a difference. I can give an account of it from the report of it, which I have here.

12 Q. You may give it and as it matures.

(Objected to on behalf of the defendants as irrelevant and immaterial.)

A.—
Due October 1st, 1899, $30,000, six per cents.
Due May 26, 1896, $60,000, four and one-half per cents.
Due October 1st, 1891, $75,000, five per cents.
Due November 1st, 1896, $90,000, five per cents.
Due October 1st, 1913, $110,000, five per cents.
Due May 15th, 1894, $75,000, four and one-half per cents.
Due December 1st, 1899, $30,000, four and one-half per cents.
Due April 1st, 1905, $100,000, five per cents.
Due December 1st, 1900, $100,000, four and one-half per cents.
Due April 30, 1906, $190,000, four per cents.
Due December 1st, 1906, $57,000, four per cents.
Due July 1st, 1917, $70,000, four per cents.
Due May 1st, 1908, $70,000, four and one-half per cents.
— September 10th, 1889, $198,000, eight per cents.
Due July 1st, 1892, $98,000, six per cents.
Due June 2, 1893, $498,000, eight per cents.
Due September 1st, 1894, $500,000, eight per cents.
Due October 1st, 1899, $3,000, six per cents.
Due April 1st, 1891, $4,000, six per cents.
Due April 1st, 1891, $13,000, six per cents.
Due July 1st, 1892, $12,000, six per cents.
Due May 4th, 1900, $432,000, seven and three-tenths per cents.

Due October 1st, 1913, $250,000, five per cents.
Due May 1st, 1908, $21,000, four and one-half per cents.
Due June 30, 1908, $10,000, four and one-half per cents.
Due April 1st, 1905, $40,000, five per cents.
Due November 16th, 1895, $20,000, five per cents.

That makes $3,155,000 on the 1st of January, 1889. Now, I think it was the 16th of May last was the date of the $75,000, four and one-halfs at 30 years—that is, this year. I am not positive
99 of the date. This $75,000 was natural-gas bonds. Then on July 1st, 1889, was $190,000, which were used to take up the $198,000 due September 10, 1889. That is all the bonds issued this year so far. The $190,000 were at four per cent. interest.

13 Q. Do these bonds cover the entire municipal debt?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. No, sir; not strictly speaking, they do not.

14 Q. In round numbers what additional municipal debt is there besides the bonded debt?

(Objected to by defendants as irrelevant and immaterial.)

A. There is an improvement-bond debt, which is a lien on certain property on the lines of the streets upon which they were issued.

15 Q. In round numbers what is that indebtedness?

(Objected to by defendants as irrelevant and incompetent.)

A. Somewhere about $350,000. In 1887 it was $165,000. Of course they are falling due every six months and the debt is being reduced all the while. It is about $350,000 all together. Then there are certificates of indebtedness which are issued for the same purpose, and they are also a lien.

16 Q. And that debt is to be paid, as I understand it, by a special levy upon the property upon the line of the improvements?

(Objected to by defendants as irrelevant and immaterial.)

A. Yes, sir. The city becomes a kind of surety for the payment of the debt. It is a lien upon the property.

17 Q. If the assessment is valid and legal the property pays it; if it is not the city pays it?

(Objected to by defendants as irrelevant and immaterial.)

A. Yes, sir.

18 Q. In what way and method is the interest on the bonded debt and the principal of the debt paid?

(Objected to by defendants as irrelevant and immaterial.)

A. It is paid by the levy of—four mills usually is the levy made every year for the purpose of paying the indebtedness. In addition to that a regular levy is levied for water-works bonds. These water-works bonds are included in the list which I gave you; but there is a special levy made—one on the foot front and another on the whole property of the city—to meet that indebtedness.

19 Q. What is the levy for water works?

(Objected to by defendants as being irrelevant and immaterial.)

A. For 1889 it was one mill and two-tenths of a mill, a decrease from the year previous of one-tenth of a mill.

20 Q. How are the streets of the city now principally lit and for how long a time have they been so?

(Objected to by defendants as irrelevant and immaterial.)

A. They are principally lit by electric light at present. I think it is only one year since they have been generally—I am not positive about that.

21 Q. Is it done, as you understand, on a contract between the city and the electric light company?

(Objected to as irrelevant and immaterial by defendants.)

A. I don't know.

100 22 Q. How is the expense of paying for the lighting of the streets paid, and by whom?

(Objected to by defendants as irrelevant and immaterial.)

A. By assessments made by the city civil engineer and ratified by the council.

23 Q. Assessments upon the property along the line of the street?

(Objected to by defendants as above.)

A. As I understand it, yes, sir. I have nothing to do with that until it comes to paying for it, and then I have got to pay according to the certified amount. There have been small payments made to the electric light companies for three or four years, I think, but it was for special lighting; but for general lighting purposes I think the first payment was made this year.

24 Q. How much was that?

(Objected to by defendants as before.)

A. I think about $17,000 in April and about $22,000 in October, but that is simply from recollection.

Cross-examination by Mr. KINNEY:

1 Q. You have been speaking about certain improvement bonds, amounting to, as you think, in the neighborhood of $350,000 now outstanding. For what sort of improvements were those given?

A. Mostly for street paving—in fact all for street paving.

2 Q. How is the fund raised for the purpose of paying those bonds off?

A. By assessments upon the property abutting the streets.

Q. How are the street improvements paid for now?

A. The contractors are paid from the sale of bonds issued for the particular improvements done in connection with the money that is paid in by the property-owners before the bonds are issued.

3 Q. What proportion of the street improvements now, if any, are paid for by the issue of assessment to the contractor?

A. That is for a different kind of improvement altogether; the assessments are issued only, as I understand it, for where the streets are turnpiked. They are first graded, and then an assessment is made on the different parties, but a permanent improvement, for the last two years, has been paid by the issue of bonds.

4 Q. And prior to that time how were these permanent improvements paid for?

A. By assessment upon the property.

5 Q. And the contractors paid how—in cash or by turning over to them the assessment?

A. By turning over to them the assessment; that is the way it used to be through a term of years. My experience as an auditor has been mostly with the new plan—that of issuing bonds.

6 Q. And the plan of paying for street improvements by the issue of improvement bonds and paying the contractor in cash has only been in use for the last three years?

A. Yes, sir.

7 Q. What proportion of the improvement bonds that are now outstanding that you have spoken of have been issued within the last three years?

A. In 1887 I think there was about $150,000; in 1880,
101 about $160,000. Those bonds have been paid off right along and as they fell due have been met—the principal and interest on these bonds and the portion which were due all have been met promptly.

8 Q. What proportion of the improvement bonds now outstanding have been issued within the last three years?

A. The whole of the improvement bonds now outstanding have been issued within the last three years.

9 Q. In giving a list of the general fund bonds you have mentioned a number of bonds bearing eight per cent. and some bearing between seven and eight per cent. I wish you would state when those bonds were issued.

A. The eight per cent. bonds were issued in 1873 for the water-works construction; the seven and three-tenths bonds were issued for the Toledo and Woodville railroad in 1870.

10 Q. Are those bonds matured?

A. No, sir; the water-works bonds will not mature until 1893 and 1894, and the seven and three-tenths bonds issued in 1870 will mature in 1900.

11 Q. For what purposes have the general fund bonds which have been issued within the last three years been issued?

A. For the purpose of refunding—taking up the bonds which were falling due.

12 Q. What is the prevailing rate of interest that the city is paying on the general fund bonds that have been issued during the last few years?

A. From four to five per cent.—averaging four and one-half.

Also GEORGE H. COLE, of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. POTTER:

1 Q. State your name, age, residence, and present occupation.

A. My name is George H. Cole; age, 28; residence, Toledo, Ohio; occupation, city clerk.

2 Q. How long have you been clerk of the city of Toledo?

A. Three years.

3 Q. And prior to that time were you deputy?

A. Yes, sir.

4 Q. For how long a time?

A. A year and a half.

5 Q. As clerk of the city of Toledo what are your general duties and of what have you control?

A. Of the records, books, and papers of the city of Toledo—all the public records and all the legislation of the city, the records of the meetings of the boards, and of all their acts.

6 Q. How many boards are there in the city of Toledo?

A. Two—a board of aldermen and a board of councilmen.

7 Q. How many members of the board of aldermen?

A. There are nine aldermen and eighteen councilmen.

8 Q. You say you have been the city clerk for the last three years?

A. Yes, sir; well, I guess before that—three and a half years.

9 Q. How many natural-gas companies are there established in the city of Toledo?

(Objected to by defendants as irrelevant and immaterial.)

A. There are only two.

102 10 Q. What are they?

(Objected to by defendants as irrelevant and immaterial.)

A. The Toledo Natural Gas Company and the Northwestern Ohio Natural Gas Company.

11 Q. And during your administration were there any franchises granted to these two companies by the city of Toledo?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Not during my administration; it was before that. There was, in the year 1886, a franchise granted to each of these companies.

12 Q. What was the date of the franchise to the Toledo Natural Gas Company and of the franchise granted by the city to the Northwestern Ohio Natural Gas Company respectively?

(Objected to by defendants as irrelevant and immaterial)

A. The ordinance granting the Northwestern Ohio Natural Gas Company the right to lay pipes and supply gas, &c., passed September 6th, 1886, and the right to the Toledo Natural Gas Company was passed September 6th, 1886.

13 Q. You were requested to produce here copies of the municipal legislation and contracts between these two gas companies and the city of Toledo. Have you them with you?

(Objected to by defendants as irrelevant and immaterial.)

A. I have copies of the legislation and of the ordinances granting them rights.

14 Q. State fully what it is that you have in your hand, and will you be kind enough to make the same a part of your deposition, marking them Exhibits A and B?

(Objected to as before.)

A. Yes, sir. Exhibit A is the legislation and franchises granted to the Northwestern Ohio Natural Gas Company—a copy of the franchise and the legislation in reference to the passage of it.

15 Q. Taken from the books of the records on file in your office?

(Objected to as before.)

A. Yes, sir.

16 Q. And are true copies of the same, are they?

(Objected to as before.)

A. Yes, sir; these are true and correct copies of the same.

17 Q. What is Exhibit B?

(Objected to as before.)

A. Exhibit B is the Toledo Natural Gas Company's franchise and the legislation in reference to the passage of it.

18 Q. Have you with you any other municipal legislation on the subject of the supply of natural gas to the citizens of Toledo?

(Objected to by defendants as irrelevant and immaterial.)

A. I have an ordinance passed July 5th, 1887, fixing the price of natural gas to be charged by the natural-gas companies in the city of Toledo for the period of three years.

19 Q. Expiring when?

(Objected to as before.)

A. July 5th, 1890.

20 Q. Will you attach that to your deposition and mark it Exhibit C?

(Objected to as before.)

A. Yes, sir.

21 Q. What, if anything, do you know about the acceptance by the natural-gas companies of that ordinance?

(Objected to by defendants as irrelevant and immaterial.)

A. Yes, sir. They have accepted the franchise and the ordinance regulating the price by a written acceptance.

103 22 Q. Both separate acceptances?

(Objected to as before.)

A. Yes, sir.

23 Q. Will you be kind enough to produce to the notary and mark the same Exhibits D and E copies of the written acceptance of the two companies referred to?

(Objected to as before.)

A. Yes, sir.

No cross-examination.

Also THOMAS R. WICKENDEN, a witness of lawful age, being first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. POTTER:

1 Q. You may state your name, age, place of residence, and occupation.

A. My name is Thomas R. Wickenden; age, thirty-six and a half years; residence, Toledo, Ohio; occupation, civil engineer.

2 Q. How long have you been city civil engineer?

A. Three and one-half years.

3 Q. How long have you been in the profession?

A. Seventeen years.

4 Q. How long have you lived in Toledo?

A. I have lived in Toledo nineteen years.

5 Q. In your capacity or service as city engineer to what extent do you have occasion to go over the city, its streets and its area?

A. I have charge of all the improvements of the streets, the building of the sewers, and such other work as is done by the city, and it requires me in the course of my duties to travel over the whole city at one time and another.

6 Q. I wish you would state as near as you can what the extent is in miles of the streets within the boundaries or limits of the city of Toledo.

(Objected to on the part of defendants as irrelevant and immaterial.)

A. I have not a very accurate estimate of that, but from my knowledge I think there are over three hundred—probably between three and four hundred—miles in the streets of Toledo.

7 Q. Do you mean by that streets opened up?

(Same objection as before.)

A. Streets dedicated to the public use, whether they are all opened up or not. I think three hundred is not too high.

8 Q. What is the superficial area of the city?

(Objected to on the part of defendants as irrelevant and immaterial.

A. Twenty-one and a half square miles, exclusive of the river, I believe. Swan creek is probably included in that, but the river is excluded.

9 Q. Can you tell us the proportion on the east side of the river and on the west side of the river?

(Objected to as before,)

A. There is about three-tenths of the area on the east side of the river, and the balance is on the west side.

10 Q. From your knowledge and observation of the city and its limits and boundaries what proportion would you say of the
104 property within the limits of the city was improved and what unimproved?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. I suppose there is fully one-half—not more than one-half—of the area that is under more or less improvement.

11 Q. About what—from your knowledge of the city and its limits and population what would you judge was the present population of the city?

(Objected to on the part of the defendants as being irrelevant and immaterial.)

A. Nearly one hundred thousand.

12 Q. Whereabouts do you locate the centre of population in Toledo now?

(Objected to by defendants as irrelevant and immaterial.)

A. I don't know as I could give it exactly. I should say it was near the intersection of Madison and Erie streets.

13 Q. And that would be distant from the intersection of Summit and Cherry streets, in a direct line, about how far West?

(Objected to by defendants on the same grounds as before.)

A. About half a mile.

14 Q. Starting from the corner of Madison and Erie streets as the centre of the population in the four cardinal points—east, west, north, and south—how far would it be to the city boundary? Take it first north—to the city boundary line?

(Objected to as before.)

A. Northerly, about two and three-quarter miles; in a westerly direction, about the same; easterly, about nearly three miles; south, two and a half or two and three-quarters.

15 Q. Take it in a due northeast course from that point, how far would it be?

(Objected to as before.)

A. Four and a half miles.

16 Q. Take it in a due southwest course?

(Objected to as before.)

A. About four miles.

17 Q. As city civil engineer, have you anything to do with the

making of the contract or the drawing of the contract or being the custodian of the contract between the city of Toledo and the electric light companies for the lighting of the streets?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Yes, sir; those contracts are in my custody.

18 Q. State when those contracts were made.

(Objected to as before.)

A. Last year, in October, I think; about October, 1888.

19 Q. How many contracts are there?

(Objected to as before.)

A. There is one contract with the Toledo Electric Light Company and one contract with the Western Electric Light and Power Company.

20 Q. The electric light companies are established within the city limits of the city of Toledo?

(Objected to as before.)

A. Yes; both of them.

21 Q. Have you those contracts in your custody?

(Objected to as before.)

A. Yes, sir.

22 Q. Will you please make copies of them to attach to your testimony as Exhibits A and B?

(Objected to as before.)

A. Yes, sir.

23 Q. Those contracts will show the price per lamp, I suppose, and the extent and duration of the contract?

(Objected to as before.)

105 A. Yes; they show the duration of the contract and the price per year for each lamp.

24 Q. About how many lamps are there now in use under those contracts for the lighting of the streets of the city of Toledo?

(Objected to as before.)

A. There are between four and five hundred.

25 Q. How generally are the streets of the city lighted?

(Objected to as before.)

A. The centre of the city is lit with lamps—its entire central area—and then there are lines of lights running out in different directions to the limits of the city in almost every direction, but the outside parts of the city—it is only on the main thoroughfares that the lights are used.

26 Q. To what extent has the lighting of the streets by electricity been extended, say within the last summer season?

(Objected to as before.)

A. Previous to the 1st of January, 1889, the larger portion of the city was lit by gas. Since the 1st of January, 1889, all the lighting has been by electric light. There was a small portion of the city that was lit by electric light previous to the 1st of January, 1889.

27 Q. For what purpose was that—as a test or a trial of the sufficiency or permanency of the light?

(Objected to as before.)

A. I suppose it was for introduction, with the object and view of introducing the electric light as a means of lighting the city.

28 Q. What is your opinion, from your knowledge and observation of it, as to its being practical, feasible, and superior to the lighting of the streets with illuminating gas?

(Objected to as before.)

A. It is entirely practical and feasible and in some respects superior to the illuminating gas.

29 Q. Has there been any recent extension in the streets of the city in the putting in of these lights?

(Objected to as before.)

A. There are small extensions made right along—new territory desiring lights.

30 Q. The citizens along the line of the streets desiring the streets to be lit by electricity make application to the council, and the council, in its judgment, completes, through the proper parties, the necessary legislation?

(Objected to as before.)

A. Yes, sir.

31 Q. And as fast as that is done the lighting of the streets by electricity is extended under the contracts which exist?

(Objected to as before.)

A. Yes, sir.

32 Q. Do you know anything about the extent to which the electric light is being used in the public buildings?

(Same objection as before.)

A. The court-house of Lucas county is lit by electric light, and a large amount of electric light in the stores and offices and other buildings about the city.

33 Q. There has been no change as yet in the rooms occupied by the council boards or by the city offices?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. All of the buildings containing the municipal offices are lit by gas.

34 Q. The city has of itself no municipal public building?

106 (Objected to on the same grounds as before.)

A. Not a municipal building. They have a number of buildings in the shape of fire-engine houses. Those are lit by gas generally. I believe the one in the 6th ward is lit by electricity, there being no illuminating gas on that side of the river.

35 Q. How is it out at the water works?

(Objected to as before.)

A. I can't recollect whether they are using gas or electricity. I think they are using gas, though.

36 Q. How extensively is it used in stores and offices and business houses—the electric light?

(Objected to as before.)

A. It is used quite largely in stores and by hotels, and I suppose, to a limited extent, in private dwellings.

37 Q. How about the hotels in the city and at the depots or passenger stations?

(Objected to as before.)

A. They are lighting there with electric lights, usually.

38 Q. In proportion to the light given by the electric lamp in the streets, as compared with the ordinary illuminating gas, how does the expense compare with that of the ordinary illuminating gas?

(Objected to by defendants as irrelevant and immaterial.)

A. The electric light, per candle power, is cheaper than gas—that is, at the rates charged by the gas company of Toledo.

39 Q. That rate being how much per thousand?

(Objected to as before.)

A. The rate to the private consumer is $1.25 per thousand, I believe, and the rate to the city is about the same, I guess.

Cross-examination by Mr. KINNEY:

1 Q. In what portion of the city are the largest tracts of what you call unimproved property?

A. They are in the outlying portions of the city—in the northerly and easterly sides of the city, and some on the west.

2 Q. What amount of the easterly side? That is the portion east of the river, I suppose?

A. Yes, sir.

3 Q. And in the northerly portion what do you include?

A. Most all of the area lying near the north city line, from its easterly to its westerly point.

4 Q. And what portion would you say of what is called the central portion of the city is unimproved?

A. It is pretty hard to say. There is quite a good portion in some parts of the city that is thickly settled, but there is some property lying unimproved.

5 Q. In your opinion what proportion of the city, excluding what

you have already designated as the easterly side and the north side or portion, is unimproved?

A. Pretty near one-quarter.

6 Q. How do you get at those figures?

A. It is simply my opinion and from my knwledge of the city and the way it is settled.

7 Q. What is the total cost to the city per annum for lighting its streets?

A. It is between $40,000 and $50,000. I can't remember
107 just now the exact number of lights we have in the city; they cost $100 per light per year.

8 Q. Do you say it is cheaper to light the city as it is now lighted than it would be to light the same territory with artificial gas at the price charged by the gas company?

A. Considering the amount of the light furnished, it is. I think the actual cost to the property-owners of the city, lighted as it is now, by electric light, the actual cost per foot front, say, will average a little less than it did when they used gas.

9 Q. And that is on the basis of the charges now made by the artificial gas company for its gas?

A. On the basis of the charges made by the artificial gas companies for lighting the streets under the contracts which expired December 31st, 1888, and the prices charged at the present time for the electric light.

10 Q. Have you any means of knowing the cost to the city per thousand — for artificial gas for lighting the streets when they were lighting by artificial gas?

A. Under the last contract, which expired December 31st, 1888, I think, the cost per thousand feet was a trifle less than one dollar per thousand.

Also GEORGE H. BECKWITH, a witness of lawful age, being first duly sworn by me, as hereinafter certified, deposes and says:

Direct examination by Mr. POTTER:

1 Q. State your name, age, residence, and occupation.

A. My name is George H. Beckwith; age, 34; residence, Toledo, Ohio; occupation, attorney-at-law.

2 Q. What official position do you now hold connected with the city?

A. I am clerk of the trustees of the sinking fund commission.

3 Q. How long have you been so?

A. I have held that for the last five years.

4 Q. And as such official what knowledge have you, or data, showing the present municipal debt of the city?

A. The trustees of the sinking fund are charged with the care and control of the funded debt of the city, and, by virtue of my position, I am acquainted with the existing indebtedness of the city.

5 Q. Will you state to the examiner, if you please, what is the bonded indebtedness of the city?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. Exclusive of the bonds issued for street-improvement purposes, it is $3,222,000.

6 Q. That covers the present bonded municipal indebtedness of the city?

(Objected to as before.)

A. Yes, sir; exclusive of the bonds I have heretofore mentioned.

7 Q. Has the sinking fund board or the trustees any fund on hand now or is it substantially all invested in the purchase of bonds?

108 (Objected to by the defendants as irrelevant and immaterial.)

A. In addition to the securities which are held by the trustees for sinking fund purposes, there is, perhaps, in round numbers, say, twenty thousand dollars in cash—fifteen to twenty thousand dollars in cash.

8 Q. Is there any limitation or restriction as to the amount of money which the board shall retain or have on hand?

(Objected to as before.)

A. The restriction upon the uninvested funds which we have in our possession is that not more than ten thousand dollars shall be kept on deposit if desirable investments can be made.

Cross-examination by Mr. KINNEY:

1 Q. What is the total value of your securities which you have on hand?

A. I think, in round numbers, about $150,000.

2 Q. What is the nature of those securities?

A. Our securities consist of general fund bonds of the city of Toledo, street-improvement bonds of the city, and certificates of indebtedness of the city.

3 Q. Have you any moneys invested in natural-gas bonds?

A. We have $10,000.

4 Q. That is of the first $75,000?

A. Yes, sir.

Also CHARLES A. VORDTRIEDE, a witness of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says:

Direct examination by Mr. POTTER:

1 Q. State your name, age, residence, and occupation.

A. Charles A. Vortriede; 35 years old; Toledo, Ohio; county auditor.

2 Q. How long have you been in the auditor's office from first to last, in this county?

A. Since 1878, with slight interruptions.

3 Q. Have you been county auditor from that time?
A. No, sir.
4 Q. How long have you been county auditor?
A. Since the fall of 1884, with the exception of about ten months.
5 Q. How long have you lived in Toledo?
A. I have lived here about twenty-two years.
6 Q. As auditor of the county of Lucas you have the custody and control of what records, papers, and documents? I am speaking generally.
A. All the records of the commissioners, the records of all the roads and ditches, records of all tax matters, the county duplicates, and the making up of the taxes.
7 Q. Where are the tax duplicates made up?
A. In my office.
8 Q. Under whose supervision?
A. Under mine.
9 Q. Including the duplicates of the city of Toledo?
A. Yes, sir.
10 Q. In round numbers what is the grand aggregate duplicate valuation for the property in the city?

(Objected to by defendants as irrelevant and immaterial.)

A. In the year 1888—the 1888 valuation was $32,617,720.
109 We are figuring on an increase this year of half a million; that would make it $33,117,720—that is, just adding a half a million in round numbers. It may be a little more than that.
11 Q. What was the rate of taxation for the city for the past year?

(Objected to by defendants as irrelevant and immaterial.)

A. The total rate last year was 2.70—that is, twenty-seven mills on the dollar.
12 Q. What is it this year?

(Objected to as before.)

A. Twenty-nine mills or $2.90 on the $100.
13 Q. State, if you can, or prepare and give to the notary, the duplicate value of the unimproved property of the city and of the improved property.

(Objected to by defendants on the ground of irrelevancy and immateriality.)

A. I couldn't give you an intelligent estimate on that now, but I can prepare it from figures in the office; it will be pretty near exact.
14 Q. Will you hand it to the stenographer to attach as an exhibit to your testimony?

(Objected to as before.)

A. Yes, sir. We have the data in the office from which it may be prepared.
15 Q. Can you give us approximately the proportion that the un-

improved property in the city bears to the improved property in the city—that is, the property built upon and improved and not built upon or improved—the proportion between the two?

(Objected to as before.)

A. I could simply make a guess at it. I should think there was over one-third of the property in the city improved—not a great deal over one-third—that is, taking the number of lots in the city.

16 Q. Can you get at it by data in your office?

(Objected to as before.)

A. We could, of course, tell just how many lots would be improved, but it would take a little while to do it.

17 Q. You say the duplicate valuation of the city is some $32,000,000? Does that include the personal property?

(Objected to by defendants as irrelevant and immaterial.)

A. Everything; yes, sir.

18 Q. How much of that is the valuation on personal property?

(Objected to as before.)

A. $9,467,100.

19 Q. The assessment on the duplicate covers the real and the personal property both?

(Objected to as before.)

A. Yes, sir; on both.

20 Q. This increase, you say, of half a million is mostly on personal property?

(Objected to as before.)

A. No, sir. There is a reduction on personal this year. The increase is principally on real estate—buildings principally.

Cross-examination by Mr. KINNEY:

1 Q. From what data do you form the opinion that not much more than one-third of the property in the city is improved?

A. I have not formed it from any data particulary; that is just merely a guess, as I say. Of course from the general knowledge that I have of the city—take, for instance, the Sixth ward; a great portion of it is not improved, and in the Eighth ward there are some
110 additions of some three or four hundred lots without a house on and, of course, some again where there are improvements on every lot.

2 —. Where are these portions particularly?

A. Particularly in the Sixth ward, and also in the First ward, the Ninth ward, the Eighth ward—in the outlying wards.

3 Q. In those various wards how does the unimproved portion lie—in a body or a few bodies of land or scattered all over the ward?

A. In some cases they are little settlements, scattered in different places, which is generally the case. Then there is a little settle-

ment here and another one here, with intervening spaces which are vacant. In the Seventh ward also there are some districts yet largely vacant.

4 Q. You have no definite knowledge, I suppose, of the number of lots there are in the city of Toledo?

A. No, sir.

5 Q. Nor of the number of houses?

A. We have the data from which we can find out. It would not be the exact number, either, because we only take the buildings worth a hundred dollars for taxation. All the buildings of that kind we could count up. Then, of course, we could tell from the books the number of lots there are and arrive at it almost to a certainty.

6 Q. When was the present duplicate value of the real estate of the city of Toledo, independent of the improvements, taken?

A. The last general valuation was in 1880; it took effect in 1881.

7 Q. And what further valuations of real estate have been had since that date?

A. Where new plats have been made they have been valued generally at a largely increased valuation over the old valuation, and whenever structures have been built have been charged on the duplicate.

8 Q. That is done once a year, as I understand it?

A. Yes, sir.

9 Q. What would you say as to how the duplicate valuation that was fixed by the appraisement of 1880 compares with the present actual value of the real estate?

A. That is a thing that is pretty hard to tell. I could simply give a guess at it. We call our duplicate valuation a sixty per cent. valuation. Of course it is not that; it is probably nearer forty per cent., the average. Of course we have some property on the duplicate for more than you could sell it for; and, again, there is property on the duplicate at not one-tenth of its value.

10 Q. Then, in your opinion, the present duplicate valuation of real estate in the city of Toledo is, on the average, about forty per cent. of the present market value?

A. Yes, sir; the ordinary market value.

(Mr. Kinney reserves the right to cross-examine the witness upon the statements which he is to prepare and attach to his deposition.)

(The further taking of depositions under the present notice is adjourned to Saturday, October 12th, 1889, 10 o'clock a. m., at room 12 Drummond block.)

111 SATURDAY, *October 12th*, 1889.

Met and adjourned, by consent of parties, to Monday, October, 14th, 1889.

MONDAY, *October 14th*, 1889.

Met again and adjourned, by consent, to Saturday, October 19th, 2 p. m.

SATURDAY, *October 19th*, 1889.

The further taking of depositions under said notice was resumed at this hour, 2 p. m., at No. 12 Drummond block.

Present: Representing complainants, E. D. Potter, Jr., Esq.; representing defendants, Guy W. Kinney, Esq.

E. W. TOLERTON, called as a witness by complainants, being first duly sworn, testified as follows:

Direct examination by Mr. POTTER:

1 Q. How long have you lived in the city of Toledo?

A. Sixteen years.

2 Q. What is your occupation or profession?

A. Attorney-at-law.

3 Q. Do you hold any official municipal position; and, if so, what is it?

A. Yes, sir. I am a member of the sinking fund commission of the city of Toledo, and also a member of the board of elections.

4 Q. Are you acquainted with the circumstances surrounding the passage by the Legislature of the so-called Toledo natural-gas bill?

A. Yes, sir.

5 Q. I will ask you to state if you were in the city of Toledo during the time of the public discussions and the general discussions with reference to the purposes and objects of that bill.

A. I was.

6 Q. In the public discussion that you heard—the general discussion—of the question what were the objects and purposes of the bill as advocated by those who were advocating its passage?

(Objected to by defendants as incompetent and irrelevant.)

A. To get cheap fuel for manufacturing purposes and for domestic purposes.

7 Q. Was there anything said in these discussions as to its being used for the purpose of lighting the streets of the city of Toledo?

(Objected to by defendants as incompetent and irrelevant.)

A. Not to my knowledge. I never heard the matter mentioned.

8 Q. Was it urged by those who were advocating the passage of the bill and its ratification by the people as to its being used for lighting purposes either of the streets or of the public buildings of the city?

(Objected to on the part of defendants as being incompetent and irrelevant.)

A. Not to my knowledge. I never heard that alluded to in the discussions favoring the passage of the bill.

9 Q. I wish you would state a little more specifically, if you can, the extent to which this matter was generally discussed as to the objects and purposes for which the bill was to be passed.

(Objected to by defendants as incompetent and irrelevant.)

A. You allude to its discussion previous to the popular vote?

112 10 Q. Yes; and how generally it was discussed.

(Objected to on the part of defendants as irrelevant and incompetent.)

A. It was most thoroughly discussed in the newspapers of Toledo, both editorially and in communications from the citizens, for perhaps two or three months prior to the popular vote, or even longer than that, and it was also freely discussed by popular meetings in the various wards of the city, where persons spoke in favor of the adoption of the measure. I think that these gatherings and meetings were held once, and perhaps oftener, in each ward of the city prior to the popular vote, and the measure was discussed thoroughly and freely on the streets and in the offices and places of business throughout the city for a long time previous to the vote.

11 Q. Generally, so far as you know, what was it argued by those who were advocating the passage or the adoption of the measure or bill?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. It was urged, first, that we were paying too much for gas, and that at the prices we were then paying it would be impossible to get manufacturing establishments into the city, and they were paying too much for domestic purposes also, and it was urged that if we could carry by a popular vote the measure that we could have cheap fuel and induce manufacturing establishments to locate here, and have it cheaper in our homes. Those, so far as I know, were the matters which were urged in favor of the passage of the law.

12 Q. In these general discussions, so far as you knew, was there anything said about the adoption of the measure or the passage of the bill for the purpose, not of the city's going into the business, but of holding it over the existing gas companies as a menace or club or threat to induce them to reduce the prices?

(Objected to as irrelevant and incompetent.)

A. That thing has been frequently talked of; yes; and that if the measure were passed and sustained it would have a salutary influence on the Northwestern Natural Gas Company and get them to make a suitable reduction in the price of their gas.

Cross-examination by Mr. KINNEY:

1 Q. Was there anything said in any of these discussions about the gas territory from which Toledo could draw gas being limited and being rapidly taken up and gotten under the control of the existing gas companies?

A. I think that that was alluded to frequently—often.

2 Q. How? In public prints and in the meetings, do you mean?

A. Yes; I think that that feature of the case was alluded to when the matter was spoken of—that the gas territory was limited in extent and amount and was being taken by the parties interested,

not alone by the Northwestern, but by the cities of Tiffin and Findlay and other parties interested, and being bought up by the parties, either for the purpose of use or for the purpose of speculation.

3 Q. Was that given as one of the reasons why the city
113 should have the power to construct a pipe line and furnish gas?

A. My recollection is that it was generally stated in this way: that if anything was done in the matter it ought to be done speedily, as delay would make it hazardous for the purpose of getting the territory.

4 Q. Was there anything said in these public discussions about the result to the city of Toledo and its citizens in case all of the gas territory should come under the control of the gas companies now furnishing gas to the city of Toledo and other corporations outside of the city of Toledo?

A. Well, this was said in that connection: that if the gas territory should be bought up by the Northwestern Company and by Findlay and Tiffin and other parties that the city would necessarily have to pay more for lands which they might hereafter get; that it would make the lands high in price, and, as I have said before, my recollection is that it was frequently urged that a delay in the adoption of the measure meant a high price for gas lands, because they were being taken up by speculators and by parties interested.

5 Q. In that connection what, if anything, was said about a delay being likely to result in all this territory being controlled either by the companies now furnishing gas here or by outside companies or municipal corporations, and that as soon as that control was obtained, the citizens of Toledo being compelled to pay exorbitant prices for their gas—in other words, what I want to get at is whether the question was discussed with the view of the gas companies obtaining a complete monopoly of all the gas territory tributary to Toledo, and when they had obtained that of raising their prices upon Toledo citizens?

A. The question was frequently referred to, that it was one of the possible things that the gas companies and other parties would get control of the territory, and then it was further said that as a result of that it would be difficult for the city to obtain the natural-gas lands necessary, or if they did obtain them they would have to pay a greater price for them. I think that that fact was mentioned often, that in case this company or those parties got control of the territory that they would create a monopoly and raise the price of fuel and prevent the establishment of manufactories, and it was often said that they would cut off the right of factories using it altogether. I think that fact was very often mentioned, that unless the city brought in its line and this matter were left to the Northwestern Company that they would eventually decline to furnish gas for the factories, for the reason that they preferred to furnish it for domestic purposes. My recollection is that that feature of the case was spoken of very frequently.

6 Q. Who was to have the use and benefit of this gas to be fur-

nished by the city, according to the discussions which were had here in the city pending the adoption of this enabling act and pending the vote?

A. Do you mean that if the city pipe line was constructed who was to get the benefit of it?

114 7 Q. Yes.

A. As I have already stated, my understanding of the discussion, in the newspapers and on the rostrum, was that it would make cheaper gas for domestic use, and also that they would have cheaper fuel for manufacturing purposes, and those two features of the case, so far as I recollect, were urged very strongly as the reason why this measure should be adopted.

8 Q. According to that discussion, was the use of the gas to be limited to any particular locality in the city or any particular class of customers, or was the discussion to the effect that it was to be general, to all the citizens of Toledo?

A. If I understand the question, it was stated by those who were in favor of the pipe line, or the majority, that eventually they would put the pipe into the different streets of the city so as to furnish the homes of the city with gas for domestic use. It was not stated that that would be done at once, but that eventually, as they were able to do it, they would get it all through the city. My recollection of that discussion is about this: There were some who favored the construction of what they called a manufacturers' line, and I think that it is a fact that those who favored simply a manufacturers' line were largely in the minority; and then there were others, and a larger number, who took part in this discussion favoring the construction of this pipe line, and the gas to be furnished thereby was to be for manufacturing purposes and for the domestic purposes of the people of Toledo.

9 Q. You have already stated that they hoped in this way to get cheaper gas for manufacturing purposes, and also for domestic use. What other benefits did they say they expected to get from the furnishing of the gas, in these discussions or articles?

A. Well, as I have stated, the knowledge which I had of the measure obtained from these discussions which I have spoken of, the two purposes were, I think, that they could furnish cheap fuel for manufacturing purposes and therefore induce people to come here and locate with their factories and their business; and the other was they maintained that the present company was charging too much for gas, and that if this measure should go through that the people in their homes could have gas cheaper.

10 Q. Did they claim that this would result in a large increase in the population of the city and a large increase of the value of the taxable property in the city?

A. Oh, it was often asserted by those who were in favor of the measure that if we could get factories here that that would increase the population, of course, and increase the wealth of the city.

11 Q. These discussions which you have spoken of, when did they occur—prior to the passage of the enabling act by the Legisla-

ture or after that and between that and the time of the popular vote in the city of Toledo on the issue of the bonds?

A. These discussions, according to my recollection, began almost immediately after the establishment of the plant by the Northwestern Company, and from the time it began to furnish fuel, and increased in velocity and vehemence down until the time when the popular vote was taken.

115 Re-examination:

1 Q. On the subject of increased duplicate valuation, wasn't that more on this line, the discussion, that in order to levy a tax to meet the bonded indebtedness and interest upon the bonds and fall within the statutory limit of taxation that it would be necessary to increase the duplicate valuation of property within the city, and that that increase would probably arise in 1889, at the decennial valuation?

A. It was often discussed in the newspapers and in these meetings as to the effect of the building of the pipe line upon the taxation of the city property. On one side it was asserted that the bonded indebtedness would be increased, and that the rate of taxation would also be increased, and, in answer to that, those who were in favor of the measure and of the building of the pipe line maintained that if the pipe line were built the result would be the establishment of factories and of a growth of the city, and the tax duplicate would be increased in amount by reason of this increased wealth, so that the burden on the increased indebtedness could be borne without any difficulty by the people. I think that is about as I understood it; I know that is the way I heard many talk.

GEORGE H. BECKWITH, previously sworn herein, being recalled by complainants, further deposed and said:

Direct examination by Mr. POTTER:

1 Q. How long have you lived in Toledo?

A. Thirteen years.

2 Q. And your profession is that of an attorney?

A. Yes, sir.

3 Q. And do you mean that you have lived here the last thirteen years?

A. Yes, sir.

4 Q. Were you in the city of Toledo during the discussions immediately prior or about the time of the passage of the so-called Toledo natural-gas bill?

A. Yes, sir.

5 Q. And were you acquainted at that time with the public discussions and general discussions among the people?

A. Yes, sir.

6 Q. How extensively was the matter discussed by the advocates of the bill and by those opposed to it?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Prior to the introduction of the proposed bill into the Legislature, and likewise after its introduction, it was very thoroughly discussed, both at public meetings and in the newspapers, by both the advocates and the opponents of the measure.

7 Q. By those advocating the measure, how fully and how generally was it discussed?

A. Of course my remembrance is not as fresh upon the subject now as it was then, but my remembrance is that it was very thoroughly discussed in all its phases and in all its aspects by those advocating the bill.

8 Q. In the wards or throughout the city?

116 A. I think the discussion extended largely throughout the city, at the meetings which were held at the various wards—general meetings, and also street discussion.

9 Q. And you have a recollection of these discussions? What was the object and purpose of the act enabling the city to engage in the enterprise of building this line and purchase the territory, etc., and supplying the gas? What was the object and purpose as advanced by those who advocated the adoption of the measure?

(Objected to on the part of defendants as irrelevant and immaterial.)

A. As near as I can remember, the chief arguments advanced by those favoring the passage of the act were, that owing to the discovery of gas in the gas fields of Ohio and Indiana, that it was necessary for Toledo, if it expected to keep pace with the growing cities lying within those fields, that they must be able to offer inducements to manufacturing establishments substantially the same as those offered by the other cities lying within that territory, and for that purpose it was held that the city—that the citizens—should be able to offer to those manufacturers who were seeking a location gas at cheaper rates than the Northwestern and the other companies would agree to furnish it; that to secure this, negotiations having failed with the gas companies, it was deemed necessary to enter the business; that it would be necessary for the city to enter the business and purchase or lease lands and construct a pipe line and furnish manufacturers as well as others with gas at a much reduced price; in other words, as near the cost of production as possible.

10 Q. For whose benefit, in these discussions, was the city's engaging in this enterprise directed?

(Objected to as incompetent and irrelevant.)

A. It was supposed to be for the benefit of the city itself and likewise for the benefit of its citizens.

11 Q. You mean by the city—that is, to the extent of bringing manufacturing enterprises?

(Objected to by defendants as before.)

A. Yes, sir; I think that would be it—to the city at large.

12 Q. In the other you mean furnishing gas to its citizens for do-

mestic purposes cheaper than the gas companies were willing to furnish it?

(Objected to by defendants as before.)

A. Yes, sir.

13 Q. In those discussions, so far as you know, was it claimed or urged by those advocating the measure that it was to be used for the purpose of lighting the streets of the city or for the lighting of the public buildings of the city or the heating of the public buildings of the city?

(Objected to by defendants as incompetent and irrelevant.)

A. My remembrance is that it was hardly deemed feasible to use fuel gas for the purpose of lighting the streets; it was, as a matter of fact, urged, however, that the public buildings of the city, including the school-houses, the city buildings, the court-houses, and the insane asylum, could be heated at much less than the present rates now charged for fuel.

117 14 Q. The main and principal objects and purposes of the building, as urged by those advocating the measure—what do you say they were?

(Objected to by defendants as before.)

A. Well, all of the various matters that I have heretofore mentioned were urged and argued on behalf of the passage of the bill.

15 Q. Please go a little more into detail, as to the citizens generally.

(Objected to as before by defendants.)

A. Among the arguments which I have before referred to, and which were urged on behalf of the passage of the bill and the submission of the enabling act to the citizens, were that they would be able thereby to offer special inducements to manufacturing establishments from other places to locate here, which would tend to increase the population of the city, to add to its tax duplicate by reason of the improvements which would follow their location; that it would also enable the citizens to secure gas for domestic purposes at prices less than those then paid to the existing gas companies.

16 Q. Was anything said by those advocating the bill as to—if it was adopted—as to whether it would be in fact executed or carried into execution or not?

(Objected to by defendants as incompetent and irrelevant.)

A. At the earlier meetings, pending the discussion of the measure, it was urged quite strongly that it was very desirable for the Legislature to pass the act, because that passage would enable the advocates of the bill to hold it over the existing companies and use it as a means whereby they could obtain reduced rates for public and private consumption.

17 Q. In speaking of public consumption, what do you mean by that?

(Objected to by def'ts as before.)

A. As I have before mentioned, figures were given during this discussion to show the amounts paid by the city for heating these various buildings, and it was claimed and urged that with gas furnished at a nominal cost quite a saving would result to the city by reason of the establishment of a city line.

(No cross-examination.)

The further — of depositions herein is adjourned to Monday, October 21st, 1889, at 2 o'clock p. m., at the same place.

118 2 O'CLOCK P. M., MONDAY, *October 21st*, 1879.

The further taking of testimony resumed.

Present, representing the complainants: A. W. Scott, Esq.
" " defendants: Guy W. Kinney, Esq.

JOSEPH W. CUMMINGS, a witness of lawful age, being first duly sworn, as hereinafter certified, testified and deposed as follows:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, place of residence, and occupation.

A. My name is Joseph W. Cummings; age, 51; residence, Toledo, Ohio; I am probate judge of Lucas county.

2 Q. How long have you been a resident of the city of Toledo?

A. Nearly all the time for twenty-three years.

3 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for natural gas was had and when afterwards an election was held in reference to it?

A. I was, during all the time.

4 Q. If there were popular discussions in reference to this matter did you have any general knowledge of it?

A. I never attended but one public meeting where it was discussed, but I heard it discussed in private circles, in public offices, on the streets very generally, and in the press.

5 Q. What was the use to be made of the pipe line, as evidenced by these popular expressions made at that time?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Why, the advocates of the bill advocated its construction for the purpose of furnishing cheap fuel to manufacturers and for domestic purposes.

6 Q. In any of these expressions of the use to be made of the gas to be conducted through this pipe line, was it ever suggested that the true purpose of the enterprise was the lighting and heating of public buildings and the lighting of the streets of the city of Toledo?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. No; I never heard either of those urged as the purpose, or one of them or two of them, for the building of it.

7 Q. Was it urged by the advocates of this measure that probably they would not engage in the enterprise even if the necessary legislation was adopted, but that it was advisable to have the legislation for other purposes; and, if so stated, what other purposes were suggested?

(Objected to by defendants as incompetent and irrelevant.)

A. The most of the advocates of the bill that I heard express themselves on that subject stated that it wasn't the intention or purpose to build the line, but that the legislation necessary should be effected so that the city would be in a shape to hold a club over the heads of the companies who were already here.

8 Q. In stating the purposes for which the gas was to be used, if you can, I wish you would state more fully, or rather more
119 specifically, the main purposes mentioned.

(Objected to on the part of defendants as incompetent and irrelevant.)

A. The only purposes mentioned for its use in my hearing were, as I have already stated, for domestic use and for maunfacturing purposes and to furnish gas cheaper than the present gas companies were furnishing it.

Cross-examination by Mr. KINNEY:

1 Q. What public meeting was it that you attended?

A. A meeting at the time that the committee of the Legislature were here—held at Memorial Hall.

2 Q. Didn't you, at that meeting or at some of the other discussions that you heard or in the newspaper articles that you read on the subject, hear something said about the furnishing of this gas to public buildings for heating purposes?

A. I have no recollection of hearing that purpose mentioned as one of the objects in building a citizen's pipe line.

3 Q. How generally, according to these discussions that you heard, was the gas to be furnished by the city to be used? Was it to be used in a limited territory or by a special class of citizens, or was it to be used for the use of the entire city and all the citizens?

A. The argument was that it would be used by all the citizens and to manufacturers at a mere nominal price.

4 Q. In any of those discussions did you hear anything said about a limited gas territory tributary to the city of Toledo from which gas might be drawn for the use of the city?

A. Yes, sir.

5 Q. And the statement that the territory was being rapidly bought up by the gas companies then furnishing the gas to the city of Toledo and by other municipal corporations in Northwestern Ohio?

A. Why, I had frequently heard that statement—that it was already largely under lease, so far as developments had been made.

6 Q. And in connection with that did you hear any statements to the effect that if the city was not permitted to purchase gas territory and construct a gas line that very soon this gas territory would all be owned by these companies and the outside corporations, and that then companies then furnishing gas to the city of Toledo would have a monopoly of the business of furnishing gas to the city and its citizens and would then charge exorbitant rates?

A. I had heard substantially that argument made.

Also FRANCIS J. KING, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. Francis J. King; age, 70 years; residence, Toledo, Ohio, and occupation, attending to my private business and assisting about the Second National Bank.

2 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for natural gas was
120 passed, and when afterwards the election was held in reference to it?

A. Yes, sir.

3 Q. Before and up to the time of the passage of this legislation and the election did you have a general knowledge of the popular discussion, declarations, and announcements relative to the purpose of said gas line as it was to be made by said city?

A. Yes, sir.

4 Q. What was the use to be made of it as evidenced by these popular expressions, as you say?

(Objected to by defendants as incompetent and irrelevant.)

A. To get cheap gas for manufacturers and have it within the reach of every poor man in the city.

5 Q. How was the expression given to the popular idea of the use to be made of the pipe line by the city—I mean was it by the newspapers and the public talked?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. The public talk; and I take the Bee, and I used to see occasionally something in the Bee about it, but it was the general talk. I never went to only one public meeting, and was there only a short time at that time. I was over to the meeting when the committee of the Legislature was here, but I was only there a short time.

6 Q. In any of these expressions of the use to be made of the gas to be conducted through this pipe line was it ever suggested that the true purpose of the enterprise was the lighting and heating of the public buildings and the lighting of the streets of the city of Toledo?

(Objected to by defendants as incompetent and irrelevant.)

A. I heard the public buildings mentioned, but I never heard the streets mentioned. I never heard the public buildings but once or twice. I heard it that day when I was up to the meeting, and a man undertook to tell me how they were imposed upon by the price they were paying for Memorial Hall heating. I never heard that generally discussed.

7 Q. You never heard it discussed that it would be used for lighting the streets?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir.

8 Q. Was it suggested by those who were advocating this measure that perhaps the city would not enter into the enterprise, but would use it as a menace or club over the heads of the companies then furnishing gas?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; I heard it, but not very much in discussion. I heard some men who were not warm advocates of the line say, "We will get the legislation and then use that as a club." They didn't believe that there would ever be a pipe line built.

Cross-examination by Mr. KINNEY:

1 Q. The talk was, was it not, Mr. King, that this gas would be furnished to all the citizens of Toledo to be used?

A. They carried out that idea; yes, sir.

2 Q. And in the discussion in reference to getting the en-
121 abling act the power that that would give the city over the heads of the gas companies would be as a sort of a club, and the claim was that it could be used as a club simply to induce the gas companies to furnish gas at reasonable rates, was it not?

A. Yes, sir.

Also TRUE W. CHILDS, a witness of lawful age, being first duly sworn by me as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. Please state your name, age, residence, and occupation.

A. True W. Childs; age, fifty-nine; residence, Toledo, Ohio; occupation, merchant.

2 Q. How long have you been a resident of Toledo?

A. Nearly 23 years.

3 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for natural gas was passed, and afterwards when the election was held in reference to it?

A. Yes, sir.

4 Q. Before and up to the time of the passage of this legislation and of the election did you have a general knowledge of the popular discussion relative to the purposes of the pipe line and the uses to be made of it by the city?

A. I heard a good deal of discussion in relation to it. It was mentioned a great deal and of a good deal of interest here at that time. It was the town talk.

5 Q. How was expression given to the popular idea of the use to be made of the pipe line? Was it by street talk, newspapers, public meetings, &c.?

(Objected to by defendants as incompetent and irrelevant.)

A. I think the newspapers had a good deal to say about it, and there was a good deal of talk on the street, and after there was a little interest up the people would gather together and talk the matter over in certain places where people were liable to get together.

6 Q. What was the use to be made of natural gas as evidenced by these popular expressions made at that time?

(Objected to by defendants as incompetent and irrelevant.)

A. The argument used was that it would build up the city by furnishing gas for manufacturers and cheap gas for general use, for fire-heating purposes, domestic purposes, and the great argument was for cheap fuel for manufacturers, and of course the growth of the city by inducing manufacturers to come here.

7 Q. In any of these expressions was it ever suggested that the purpose of the enterprise was the lighting and heating of the public buildings and lighting the streets of the city?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. I don't remember of ever hearing of the gas to be used for that purpose. I think I read something in the papers at the time of the trial in Tennessee, I think it was. I believe it was the first I ever heard of it.

122 8 Q. Did you ever hear it suggested that in all probability the pipe line would never be built, but that the legislation would be used as a club to compel the existing companies to furnish cheap gas?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes; I heard that expression used quite frequently at the time.

Cross-examination by Mr. KINNEY:

1 Q. You say you noticed nothing about the heating of the public buildings with gas in any of those newspapers or in the public discussion?

A. I don't know but that might have been mentioned, but I know the stringent argument was in favor of cheap fuel for manufacturers, and cheap fuel for domestic use was also brought up. I don't remember particularly about the public buildings; I might have heard that thing brought in, but I can't recollect.

2 Q. Do you remember of hearing any talk about the city being charged unreasonable rates for public buildings, and noticeably Memorial Hall?

A. I heard at the time of the hearing before the senate committee—some one brought that in as an argument—that there was trouble between the gas companies and the Memorial Hall trustees, I think. I never knew and don't know to-day what the trouble was, only that there was a difference of opinion there.

3 Q. And if the city constructed a pipe line it could then furnish the gas itself for these buildings?

A. I don't know about it. I might have heard something, but it didn't make any impression on my mind if I did.

Also C. W. MANAHAN, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. C. W. Manahan; age, forty-five; residence, Toledo, Ohio; occupation, real estate.

2 Q. How long have you been a resident of Toledo?

A. With the exception of five years I have been here sixteen years.

3 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for the city for natural gas was passed, and when afterwards the election was held in reference to that?

A. Yes, sir.

4 Q. Before and up to the time of the passage of this legislation and the elections did you have a general knowledge of the pipe-line discussions, declarations, and announcements relative to the purpose of this pipe line and the use to be made of it by the city?

A. Yes, sir.

5 Q. What was the use to be made of it as evidenced by these popular expressions made at that time?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Well, as I understood it, there was two arguments used. One was to get cheap gas here for manufacturers and consumers——

6 Q. By "consumers" you mean——

A. Private dwellings.

123 7 Q. In these expressions of the use to be made of the gas did you ever hear it suggested that the purpose of the enterprise was the lighting and heating of the public buildings and the lighting of the streets of the city of Toledo?

(Objected to on the part of defendants as irrelevant and incompetent.)

A. No, sir.

8 Q. Did the advocates of the measure suggest that the city might not construct the line even if the Legislature authorized it, but that the legislation would be used as a menace or club to compel the existing companies to furnish cheaper gas?

(Objected to on the part of defendants as incompetent and irrelevant.

A. My understanding was that the principal thing was to get the enabling act passed and hold a club over the present companies here so that they would make the prices low enough to satisfy the public.

9 Q. How was expression given to this public opinion?

(Objected to by defendants as incompetent and irrelevant.)

A. There were meetings held by the public, and there was also the press had a good deal to say about it, and there were meetings by the parties interested in putting the scheme through, and street talks—everybody talked about it.

Cross-examination by Mr. KINNEY:

1 Q. How generally was this gas to be used, according to the talks and discussions—that is, the gas to be furnished by the city in case they constructed their pipe line?

A. My understanding was that it was to be used by manufacturers and private consumers.

2 Q. Was it to be limited to any particular territory or particular class, or was it for general use to all the citizens or people?

A. For everybody.

3 Q. In these discussions or in the articles that you read in the newspapers or in any of this talk that you listened to I will ask you whether you didn't hear the question of the heating of the public buildings discussed.

A. I never heard it discussed by the public at all. I heard the question asked, just before the suit was tried down in Nashville, what the cost of the heating of the public buildings was, but I don't remember of hearing it before the enabling act specially.

4 Q. Did you attend any of the public meetings?

A. No, sir.

Also GEORGE W. DAVIS, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. George W. Davis; age, 57; residence, Toledo, Ohio; occupation, president of the Second National Bank.

2 Q. How long have you lived in the city of Toledo?

A. Since 1854.

124 3 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for natural-gas purposes was had?

A. Yes, sir.

4 Q. And when afterwards an election was held here in reference to it?

A. Yes, sir.

5 Q. Before and up to the time of the passage of this legislation and the election did you have a general knowledge of the popular discussions and declarations relative to the purposes of this pipe line and the use to be made of it by the city?

A. Well, generally. I think so.

6 Q. How was that expression of public opinion given? In what way was it given?

(Objected to by defendants as incompetent and irrelevant.)

A. It was given by public meetings and the collection of the people on the corners and in general ways; through the press.

7 Q. What was the use to be made of the natural gas and this pipe line as evidenced by these popular expressions made at that time?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Well, it was proposed—the men who were advocating it—they proposed to give free gas, free to the public, or as near free as could be, and pay the expenses, or something of that sort.

8 Q. For what purpose?

(Objected to by defendants as incompetent and irrelevant.)

A. Manufacturing purposes—yes; both—and domestic use.

9 Q. In any of these expressions of the use to be made of the gas did you ever hear it suggested that the purpose of the enterprise was the lighting and heating of the public buildings or the lighting of the streets of the city?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. No; I don't think that that ever entered into the arguments very much; at least I didn't know anything about the lighting of the streets. The heating of the city buildings, I suppose, would come in the natural course with the citizens.

10 Q. Did those who advocated the measure state that possibly the city might not build the pipe line, but simply use the suggested legislation as a menace or club to compel the existing companies to furnish cheaper gas?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Yes; I heard very many expressions of that kind That seemed to be their argument, the argument of those in favor of the pipe line. I heard numerous business men say, "I wouldn't vote for this thing if I supposed it was going to pass and carry, but we want a club to hold over the Standard Oil people." One of my own directors made that point with me when I had a little argument with him.

(No cross-examination.)

Also WILLIAM J. COLBURN, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.

A. W. J. Colburn; age, 45; residence, Toledo, Ohio; occupation, wholesale dealer in hats and caps.

125 2 Q. How long have you lived in Toledo?

A. I have lived here seventeen years and a half, about. I came here in the summer of 1872.

3 Q. Were you in the city of Toledo when the legislation authorizing the city to build and maintain a pipe line for natural gas was passed, and afterwards when the election was held in reference to it?

A. Yes, sir; I was.

4 Q. Before and up to the time of the passage of this legislation and the election did you have a general knowledge of the public discussions relative to the purpose of this pipe line and the use to be made of it by the city?

A. Yes, sir.

5 Q. How was that expression given to the popular opinion?

(Objected to by defendants as being incompetent and irrelevant.)

A. By public meetings and by general discussion on the street corners and through the press and most every way it could be discussed.

6 Q. What was the use to be made of the natural gas as evidenced by these popular expressions made at that time?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. The talk was that they would furnish cheaper gas or practically free gas to manufacturers, and also to private consumers and for domestic purposes, &c.

7 Q. In these discussions did you ever hear it suggested that the purpose of the pipe line was the heating of the public buildings and the lighting of the streets?

(Objected to by defendants as incompetent and immaterial.)

A. No, sir.

8 Q. Did you ever hear any other motive urged than the ones you have already suggested?

(Objected to by defendants as incompetent and irrelevant.)

A. I heard the idea, or the motive was that a great many people in favor of and voting for the act did not really want the pipe line built, but to hold it as a club over the Standard and induce them to to reduce their prices to the manufacturers and residents; that I heard frequently.

Cross-examination by Mr. KINNEY:

1 Q. In that connection did they claim that the companies were charging too much for their gas?

A. Yes, sir.

2 Q. To both manufacturers and to private consumers?

A. Why, some did, and some claimed, perhaps, that the charges to private consumers were cheap enough, but not cheap enough to manufacturers. There were different claims in regard to that matter. They would not, perhaps, agree as to that.

3 Q. Did you attend any of the public meetings which were called to discuss the question?

A. I can't remember whether I did or not now.

4 Q. How generally in those discussions was this gas to be used? Was it to be used in any special territory or for the general use of all the people in the city?

A. Well, for general use so far as heating was concerned, but not in relation to lighting.

5 Q. I am talking about heating.

A. Yes, sir.

126 6 Q. Did you hear anything said or read anything in the newspapers about what was claimed to be exorbitant prices paid for heating the public buildings by gas?

A. Yes, sir; something in relation to Memorial Hall, I think.

7 Q. In that connection was it not said that if the city was permitted to build a pipe line it would furnish heat for those buildings?

A. I don't remember whether they claimed that they would furnish it free.

8 Q. But that they would furnish it to the buildings?

A. Yes, sir.

9 Q. So that in that way you did hear expressions in relation to the heating of the public buildings?

A. I might have heard it in relation to Memorial Hall. They claimed that the gas was too high. I can't recollect whether they were going to furnish it free to Memorial Hall or not, but there was nothing in relation to the lighting of the public buildings or the streets. I think I must have gone to some of their meetings, but I can't remember; but I couldn't fail to hear the discussions.

10 Q. Did you hear any discussion in reference to the territory from which this gas could be obtained being limited in amount, and that it was rapidly being bought up or leased by the existing gas companies and by others outside of the city?

A. I think I heard claims of that kind; yes, sir.

11 Q. And if the city was not permitted to go into the business that this territory from which Toledo could draw would be controlled by the gas companies?

A. I heard arguments of that kind; yes, sir.

Also WILLIAM A. GOSLINE, a witness of lawful age, being by me first duly sworn as hereinafter certified, testified as follows:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.
A. William A. Gosline; age, 55; residence, Toledo, Ohio; coal and iron dealer.
2 Q. How long have you lived in Toledo?
A. I have lived in Toledo eighteen years.
3 Q. Were you in Toledo when the legislation authorizing the city to build and maintain a pipe line for natural gas was passed, and when afterwards the election was held in reference to it?
A. Yes, sir.
4 Q. At that time did you have a general knowledge of the popular discussions relative to the purpose of the pipe line and the use to be made of it by the city?
A. Well, yes; I should say I did.
5 Q. What was the use to be made of it as evidenced by these popular expressions at that time?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Well, for the heating of houses and the use of manufacturers.
6 Q. Did you hear it suggested by those advocating the measure that the purpose of the enterprise was the lighting and the
127 heating of the public buildings and the lighting of the streets of the city?

(Objected to on part of defendants as incompetent and irrelevant.)

A. Well, I never heard of its being used for lighting the streets that I know of, but I have heard a great deal of discussion about bringing it here to use for heating and for manufactories.
7 Q. Did you ever hear it suggested by those who were advocating the measure that the pipe line might not be built even if the legislation was passed, but that the legislation might be used as a club over the heads of the existing companies?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes; I heard that very often. That was the first plan, I think.

(No cross-examination.)

Also ROBERT CUMMINGS, a witness of lawful age, being first duly sworn, testified as follows:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.
A. Robert Cummings; age, 62; residence, Toledo, Ohio; occupation, retired merchant.
2 Q. How long have you lived in Toledo?
A. I have lived here 31 years.
3 Q. Were you here when the legislation authorizing the city to

build and maintain a pipe line for natural gas was passed and when the election was held in reference to it?

A. Yes, sir.

4 Q. Before and up to the time of the passage of this legislation and this election did you have a general knowledge of the popular discussions relative to the purposes of the pipe line and the use to be made of it by the city?

A. Oh, yes; I heard more or less of it—of course not so much as a man engaged in business, because I was at home when I had no other business; was about home. Of course I heard more or less of it.

5 Q. What was the use to be made of it as evidenced by these popular expressions at that time?

(Objected to by defendants as incompetent and irrelevant.)

A. It was said that they would pipe it here for the same purpose as they had in other places—for private consumption and for manufacturers.

6 Q. Did you ever hear it urged that one of the purposes of the enterprise was the lighting of the streets of the city?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. No, sir; I never heard that spoken of.

7 Q. Did the advocates of the measure suggest that the city might not build the line, but use the threat to build it as a club over the heads of the present companies to compel them to furnish cheaper gas?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. I don't remember that the question was agitated in regard to these present companies bringing it in; that there was any talk of the city building then a line.

128 8 Q. I mean at the time of the advocating of this measure.

A. Oh, yes; that was spoken of in the papers and I heard it from individuals—both in the public press and by individuals.

Cross-examination by Mr. KINNEY:

1 Q. You say that the talk was that this gas was to be used generally for heating purposes—this gas which was to be furnished by the city?

A. Yes, sir.

2 Q. And the talk was that if the city brought the gas here that gas would be used generally in the city for heating purposes?

A. Well, yes.

3 Q. For all sorts of buildings and all sorts of business?

A. Yes; but I never heard anything about the lighting.

4 Q. Did you hear anything said about its being used for heating in the public buildings?

A. Why, I don't know. I think that was the argument—that they were going to use it the same as the other companies used it.

(The further taking of depositions under this notice is adjourned to Tuesday, October 22nd, 1889, at 2 o'clock p. m., at the same place.)

129 TOLEDO, OHIO, *Oct. 22nd*—2 p. m.

Met and adjourned to Oct. 23d, at same hour, by consent.

TOLEDO, OHIO, *Oct. 23d*, 1889.

Met at the usual place at 2 p. m.

Present: A. W. Scott, Esq., for the pl'ffs, and Mr. Guy W. Kinney, representing the defendants.

WILLIAM F. CRANE, a witness of lawful age, being first duly sworn by me as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. William F. Crane; age, 37; residence, Toledo, Ohio; occupation, secretary and treasurer of the Toledo Natural Gas Company.

2 Q. The gas company of which you are treasurer is one of the companies who are furnishing natural gas to the city of Toledo?

A. Yes, sir.

3 Q. Can you give the amount of the mileage of pipe laid by your company within the city limits?

A. I think I can; yes, sir.

4 Q. You may please do so.

(Objected to by counsel for defendants as incompetent and irrelevant.)

A. I have got some figures here that will probably give you what you want. This is all in feet. This is according to our last tax return, and that report was made from actual measurement of the pipe in the city at that time. It was between the first of June and July of this year.

10-inch-pipe	25,392 feet
12-inch-pipe	336 "
8 " "	66,245 "
6 " "	74,201 "
4 " "	99,338 "
3 " "	13,118 "
2½-inch pipe	3,279 "
2" " "	5,531 "
1" " "	4,428 "

I can give you the service lines:

4-inch-pipe	130 "
3 " "	598 "
2½-inch pipe	68 "
2 " "	6,316 "
1½ " "	1,135 "
1¼ " "	64,637 "
1 " "	315 "

Then there has been about 3,000 feet used of various sizes of pipe since this report was made.

5 Q. Can you give the length of the main pipe from the gas territory to the city of Toledo put in by this company?

130 (Objected to on the part of defendants, by their counsel, as incompetent and irrelevant.)

A. That is about 33 miles. I can give you the exact measurements if you want them.

6 Q. That is in addition to those you have already mentioned?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes; and the thirty-three miles is on main pipe; it does not cover the lateral lines from the wells. I can't tell you just how much there is of that—probably twenty miles.

7 Q. The lateral feeders leading to the main line?

(Objected to by defendants as incompetent and immaterial.)

A. Yes, sir.

8 Q. The thirty-three miles in the main line?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

9 Q. What is the size of that pipe?

(Objected to by defendants as incompetent and irrelevant.)

A. Ten inches and twelve inches.

10 Q. The service pipe that you mention in former testimony is what?

(Objected to by defendants as incompetent and irrelevant.)

A. The service connections from the street mains to the curb.

11 Q. You don't include in this piping that you have given anything on the private premises of the consumer?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; it is company property.

Cross-examination by Mr. KINNEY:

1 Q. Where are the termini of the 33-mile line?

A. I should say at the junction of Detroit avenue and South street, at the city limit.

2 Q. And the other end?

A. At the lower part of Wood county—at the wells at the extreme southern end of Wood county—and there is a lateral line running over into the adjoining county to the Baker well.

Also HAMILTON S. CORWIN, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. Hamilton S. Corwin; age, thirty-four; residence, Toledo,

Ohio; occupation, auditor of the Northwestern Ohio Natural Gas Company.

2 Q. How long have you been auditor?

A. About a month or forty-five days.

3 Q. And prior to that time what was your position in that company?

A. General superintendent.

4 Q. Is this Northwestern Natural Gas Company one of the companies who are furnishing natural gas to the city of Toledo?

A. It is, sir.

5 Q. Can you state the length of pipe put in by that company into the city of Toledo to furnish the people with natural gas?

A. Yes, sir.

6 Q. Please do so.

(Objected to by defendants as incompetent and irrelevant.)

A. We have in the city of Toledo seventy-two miles of pipe.

131 7 Q. Can you give that in detail by the sizes of pipe?

A. Yes, sir; nearly correct.

8 Q. You may do so.

(Objected to by defendants as incompetent and irrelevant.)

A. I can give it approximately correct:

2 miles of 12-inch pipe and 10 (the 10 in.) only	$\frac{5}{100}$ of a mile.
8-inch	$15\frac{1}{2}$ miles.
6 "	21 miles.
4 "	$15\frac{1}{2}$ miles.
3 "	$11\frac{1}{2}$ miles.
2 "	5 miles.
$1\frac{1}{2}$-inch	2 miles.

9 Q. Have you given the service pipe in the last pipe you have mentioned?

A. No, sir.

10 Q. Can you state that?

A. Not without further reference.

11 Q. The amount of pipe that you have mentioned is the pipe put in by the Northwestern Company exclusive of what is known as the service pipe?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

— Q. What do you mean by service pipe?

A. The pipe from the main to the curb.

13 Q. At what time were these measurements made from which you took these figures?

(Objected to.)

A. They were made April 1st, 1889.

15 Q. Has there been any additional pipe put in by this company since?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

16 Q. Can you state approximately how much that is?

(Objected to by defendants as incompetent and irrelevant.)

A. About ten miles.

17 Q. This ten miles is in addition to the 72 miles you have already given?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; I included that in the figures already given.

18 Q. So that the figures given by you give the amount of the pipe about as it is to-day?

(Objected to by defendants.)

A. Approximately as it is to-day.

19 Q. What is the length of your main line from the gas fields to the city of Toledo?

(Objected to by defendants as incompetent and irrelevant.)

A. Thirty-six miles, about.

20 Q. That has not been included in the estimates you have given?

(Objected to as before.)

A. No, sir.

21 Q. What is the size of that main-line pipe?

(Objected to by defendants as incompetent and irrelevant.)

A. Ten-inch pipe.

22 Q. That thirty-six miles of pipe that you mentioned—does it include the feeders from the wells to the main line?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir.

132 23 Q. About how much pipe is there included in these feeders?

(Objected to by defendants as incompetent and irrelevant.)

A. I should say fifteen to twenty miles.

24 Q. What is the size of the feeders?

(Objected to by defendants as incompetent and irrelevant.)

A. From eight-inch to two-inch.

Cross-examination by Mr. KINNEY:

1 Q. Where are the termini of your main lines?

A. It is out near Stewartsville and the city limits of Toledo.

2 Q. At about what point?

A. It is about at the corner of the C., H. & D. (R. R.) and the Pennsylvania railroad—practically near that corner.

3 Q. Is this main line used to supply any place except the city of Toledo with gas?

A. It is connected in with our general system of lines—that is, it is connected with the lines that run to Fostoria and Fremont. They run in another direction; it is simply tied to it.

4 Q. Then these feeders that you speak of—they are all contributary to the main line?

A. The feeders that I referred to; yes, sir.

5 Q. And from this main line the gas is taken to supply Toledo?

A. Yes, sir.

6 Q. And is also run off into your branch lines to other places?

A. It is connected to it.

7 Q. Does the main line you have spoken of supply the other sections with gas?

A. No; this main line doesn't supply that. There is a small village on the main line called Jerry City which we do supply from the main line.

8 Q. State whether this main line and these feeders furnish gas, not only to Toledo, but to the other places that you furnish with gas?

A. No; they don't supply the other places except as I have said—Jerry City.

9 Q. What do you mean by saying that your other lines are connected with this main line?

A. The idea is to have a system of lines in the field by which, in an emergency, any town could be reached from any part of our field.

10 Q. In an emergency?

A. In case of a break on one line the other line could be used to feed the town; that is the principle on which the lines are connected together.

11 Q. But this main line to Toledo that you speak of is not the line that supplies Fostoria, Fremont, and other points?

A. No, sir; that is the Toledo line proper, but it could supply the other points in the case of an emergency; it is a system of pipes connected.

12 Q. But ordinarily the gas is not turned onto the connecting lines from this main line?

A. No; the line is open a good part of the time all around.

13 Q. For these other places that you supply—have you separate feeders for supplying the other towns?

A. Yes, sir.

133 14 Q. And the feeders which you have spoken of for Toledo don't supply the lines for the other towns?

A. No, sir; but they could be made to do so, as it is all connected up together.

15 Q. The Northwestern Ohio Natural Gas Company and the Toledo Natural Gas Companies are now practically under one management, I understand?

A. Yes, sir.

16 Q. Do the figures which you have given here include the milage for both companies?

A. No, sir.

17 Q. Do the figures giving the number of miles of pipe include any pipe outside of the corporate limits of the city of Toledo?

A. Yes; West Toledo is outside of the city, is it not, across Ottawa creek?

18 Q. How much pipe have you in West Toledo?

A. Well, I included in my figures about two miles of that pipe that have been put in at West Toledo since the tax return was made; about two miles of that was put into West Toledo.

19 Q. Was there any pipe in West Toledo prior to that?

A. Yes, sir; I have not the measure of that. I think there were two miles in there previous to this.

20 Q. Does this include any pipe in any other place outside of the corporate limits?

A. I don't think it does. I don't think there is any of the rest of it outside of the city.

21 Q. So that according to your figures here you have within the corporate limits of the city of Toledo about sixty-eight and a half miles of pipe?

A. Yes, sir.

22 Q. Do you know how many miles the Toledo Company own in the city?

A. I do not.

Re-examination:

1 Q. As I understand you the mileage of the Toledo Company is not included in your statement?

A. No, sir.

2 Q. Your statement only includes the Northwestern Ohio Natural Gas Company?

A. Yes, sir; only the Northwestern Ohio Natural Gas Company proper.

(The further taking of testimony hereunder is adjourned to Thursday, October 24th, 1889.)

134 TOLEDO, O., *October 24th*, 1889.

By agreement of counsel the hour of taking depositions herein was changed from 2 p. m. to 7 p. m., at which time it was resumed at the usual place.

Present: Representing the complainants, A. W. Scott, Esq., and E. D. Potter, Jr.; representing defendants, Guy W. Kinney, Esq.

WILLIAM F. CRANE, recalled by consent, on further examination, deposes and says:

Mr. SCOTT:

1 Q. State whether in making your statement of the number of feet of pipe you included in that statement any pipe outside of the corporate limits of the city of Toledo other than the main line.

A. Nothing but the city pipe. There was nothing in it except the city pipe.

2 Q. You gave the amount of mileage of the Toledo Natural Gas

Company in the city of Toledo. Did that include the mileage of the Northwestern Ohio Natural Gas Company?

A. No, sir; the Toledo Natural Gas Company proper.

3 Q. Do you know whether the two companies together, with their aggregate mileage, reach all of the city of Toledo or not?

A. No, sir; they do not.

4 Q. Can you tell what proportion of the city is reached by the two companies?

A. It would be a pretty hard matter. I have never figured it up. I should think probably one-third. I don't know exactly, because I have never figured it up.

5 Q. You mean one-third of the entire street mileage?

A. Yes, sir.

6 Q. What I want to get at was, as to the pipe line, what portion of the population is reached?

A. I couldn't tell you that.

7 Q. But the entire population is not reached by the two companies?

A. No, sir.

8 Q. By any considerable amount?

A. No, sir; not by a good deal. I can't tell you how much, but by quite a considerable amount.

(The same objections were made to the testimony of this witness above as applied to his former examination herein.)

135 Also WILLIAM D. HARTUPEE, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. My name is William D. Hartupee; age, thirty-six; residence, Allegheny City, Pennsylvania. I am an engineer by profession. My business is gas engineering and mill engineering and gas lines and everything in the way of engineering except civil engineering. I am not a civil engineer.

2 Q. Have you had any experience in natural gas and the piping of natural gas for the purpose of furnishing fuel?

A. Yes, sir; I have.

3 Q. Will you please state what your experience has been in that matter?

A. I have given the natural-gas business six and one-half years. In 1883—I was manager at that time of what was called the Fuel Gas Company, of Allegheny county, Pennsylvania. I then, in addition to that, was manager of the Penn Fuel Company. When those two companies sold out to the Philadelphia I was manager of the natural-gas department of the National Transit Company, and I resigned that position to take charge of the Chartiers Fuel Gas Company, and after they sold out to the Philadelphia Company I have been engaged in laying lines as engineer, manager, and consulting

engineer. I laid the Equitable Gas Company's lines at Pittsburgh; the Jefferson Gas Company's at Pittsburgh; the Pittsburgh Gas Company's; the Duquesne Gas Company's; the Versailles Gas Company's; the Mutual Fuel Gas Company's, and the Low Pressure Gas Company's, of which company I am president and manager at the present time.

4 Q. Beyond the experience which you have had in these matters have you acquired any knowledge in reference to these things beyond that by reading or study?

A. Oh, yes; I have kept up with the subject.

5 Q. With your experience, as suggested by your answer, have you been able to determine the illuminating power of natural gas as compared with other illuminants?

A. Yes, sir; in the district that I have had practical charge of I have been able to compare our gas—speaking of our field—the natural gas around Pittsburgh, in that section, as compared with the illuminating gas furnished to the cities of Pittsburgh and Allegheny.

6 Q. Can you tell how the gas in your field will compare with the gas in the Northwestern Ohio field as an illuminant?

A. I can only tell from hearsay—that is, I have heard that our gas was just about the same as this gas is here.

(Answer objected to by defendants.)

7 Q. The experience that you have passed through—has it given you a knowledge of the cost of construction of natural-gas lines?

A. Yes, sir.

8 Q. I will ask you how natural gas compares with other known illuminants as a lighting power.

136 (Objected to by defendants as irrelevant, immaterial, and incompetent, and for the further reason that the witness does not appear qualified to speak of the illuminating power of the Ohio gas.)

A. The natural gas around Pittsburgh compares to our coal gas, taking it at sixteen candle-power—we get eight and a half to nine candle-power out of our natural gas. There are certain burners that I have seen of a great deal higher power, only that is taking it with the same character of burner; but there is what is called the Welsbach burner that they claim a great deal higher power for.

9 Q. Have you ever known any natural gas that would exceed the candle-power of the Pittsburgh field?

(Objected to as incompetent and irrelevant.)

A. I have no knowledge of it. It may. I don't know. I have never heard of one.

10 Q. Wouldn't the candle-power of ordinary coal gas be increased in the same proportion with the Welsbach burner?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; undoubtedly; they claim just the same proportion.

11 Q. So far as your knowledge and experience goes what would

you say of natural gas as a practical illuminant for a system of street lighting or for domestic purposes?

(Objected to by defendants as incompetent and irrelevant, and that the witness has not shown himself qualified to speak of the illuminating power of Ohio gas.)

A. I consider it very poor.

12 Q. What are the objections to it?

(Objected to by defendants on same ground as last question above.)

A. First, you don't get a good illuminant; it is not a good illuminant; that is the first principal objection to it.

13 Q. How is it in the use as an illuminant? Is there any odor to it?

(Objected to by defendants on same grounds as last question.)

A. I have burned it in my own house. I didn't find any disagreeable odor to it. I found it an enormous trouble to keep any kind of a glass around it; it would break any kind of glass I put around it. I could only use the argand burner.

14 Q. Owing to the intense heat?

(Qbjected to on same grounds as above.)

A. Yes; and it was unstable; the slighest wind would flicker it around. If it is not carefully regulated it will smoke. Of course you can so regulate it that it will not smoke—that is, in the argand burner.

15 Q. Has your experience in the boring for and the use of natural gas shown you whether natural gas wells can be relied upon for a continuous supply or not?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, you would have to qualify that question by saying how much is drawn off.

16 Q. What I mean is, if a well of large-producing power were permitted to flow to its utmost capacity would there be, after considerable use, a perceptible diminution of its flow?

(Objected to by defendants as incompetent and irrelevant.)

A. I have never seen a well that there wouldn't be.

17 Q. Will continued flow eventually, from your experience, exhaust any well?

(Objected to by defendants as incompetent and immaterial.)

A. In my opinion, yes, sir.

137 18 Q. What is the life of an ordinary well yielding, say, fifteen or twenty million cubic feet of gas per day, from your judgment and observation?

(Objected to by the defendants as incompetent and irrelevant.)

A. That would depend entirely upon circumstances. If that well

was drawing from a gas field, say, as large as the desert of Sahara, and that was the only well there, it might last for an indefinite time. If it was drawing from a very small gas field and there were fifty or a hundred wells in that same field, it might last six months.

19 Q. From your knowledge and observation?

(Objected to as incompetent and irrelevant.)

A. I can't answer that question in that way, because every field is different. There are no two gas fields alike, and there are no two gas fields, even if the fields were alike, that have the same number of wells; that would determine the life of the fields, the number of holes in the field.

20 Q. My understanding is, then, from your experience, there is a life or an existence to any gas well from which there is a continual supply drawn?

(Objected to as incompetent and irrelevant by defendants.)

A. That is my opinion; yes, sir.

21 Q. And the extent of the life of a well would depend upon the extent of the territory which it drained?

(Objected to by the defendants as incompetent and irrelevant.)

A. And the extent of the drainage.

22 Q. And if there were other wells drawing from the same territory the life of that well would be perceptibly shortened by the drainage of the other wells?

(Objected to by defendants as incompetent and irrelevant.)

A. That is my opinion exactly.

23 Q. Is this opinion of yours based on your past experience with natural gas and natural gas fields?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; absolutely.

24 Q. Has there been any variation from this, in your experience?

(Objected to by defendants as incompetent and irrelevant.)

A. No. sir.

25 Q. Have you ever known any gas well that sustained its original pressure and flow under continual drainage?

(Objected to by the defendants as incompetent and irrelevant.)

A. No.

26 Q. Have all wells, within your experience, diminished in pressure and finally been exhausted under continual drainage?

(Objected to by defendants as incompetent and irrelevant.)

A. All those that I know anything about.

27 Q. Has your experience as a gas engineer shown you whether the business of boring for, piping, and selling natural gas is or is not an uncertain, speculative, and hazardous business?

(Objected to by defendants as incompetent and irrelevant.)

A. It certainly is; remarkably so.

28 Q. As your experience has shown you?

(Objected to as irrelevant and incompetent.)

A. Yes, sir.

29 Q. What has your experience taught you in reference to this?

138 (Objected to by defendants as incompetent and irrelevant.)

A. Well, it has taught me that it takes an awful good field and an awful good income in sight to justify any man in going into the natural-gas business to-day, with our past experience in it.

30 Q. Are there uncertainties in it?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

31 Q. What are the uncertainties in the natural-gas business?

(Objected to by defendants as incompetent and irrelevant.)

A. The failure of your field before you get your money out of your investment.

32 Q. Have you known of such instances?

(Objected to by defendants as incompetent and irrelevant.)

A. I have known of a great many—certain ones under my personal knowledge, and then a good many by hearsay.

33 Q. In your experience as a gas engineer are you qualified to estimate the cost of a natural-gas plant if sufficient details are given to you to base it upon?

(Objected to by defendants as irrelevant and incompetent.)

A. I think so.

34 Q. And from your experience in these particulars do you know what the requirements of a natural-gas plant are? I mean with reference to the size of the pipe and the necessary pressure from which you will make the estimate of the cost thereof.

(Objected to by defendants as incompetent and irrelevant.)

A. I think so, although different engineers may have different opinions upon those subjects.

35 Q. I will ask you what a natural-gas plant would cost to supply a city of from 90,000 to 100,000 inhabitants, the territory from which the supply is drawn necessitating a main line of about thirty-three miles in length and the city having a street mileage of about three hundred miles, with the purpose of supplying all of the citizens of that city and its manufacturers with fuel. What would such a line as this cost to put in actual operation?

(Objected to by defendants as incompetent and irrelevant.)

A. What would be the character of the manufactories?

36 Q. Such as are usual in a city of the size in the question.

(Objected to by defendants as incompetent and irrelevant.)

A. Pittsburgh, for instance, is a great manufacturing place, and if it was one hundred thousand inhabitants like that of Pittsburgh on the south side, which has over sixty thousand inhabitants and nearly all mills, it would take a different basis of calculation.

37 Q. The city that I refer to is not a large manufacturing place, having but one rolling mill and the ordinary manufactories of an inland city.

(Objected to by defendants as incompetent and irrelevant.)

A. Not what you would call a manufacturing city particularly. I would go about that in this way: If the city had one hundred thousand inhabitants that makes ordinarily about twenty thousand houses; we generally count five persons to a house.
139 In Western Pennsylvania we count two bushels of coal to a house. That would be forty thousand bushels of coal per day the year around. We have found that a bushel of bituminous coal is equal to about one thousand cubic feet of gas in the ordinary wasteful way in which it is burned. If that is equal to a thousand feet, that would be equal to forty million feet a day of gas. Then adding your manufactories—say at half that amount in addition to that, would be a fair average. In Pittsburgh it would be about six times the amount of consumption used in the houses, but in your city I suppose it would be about one-half; that would be sixty million cubic feet of gas every twenty-four hours for every day in the year. Now, a line, to deliver that amount of gas from a field thirty-three or thirty-five miles away—say you had a pressure out in your fields of two hundred pounds—that you could carry a well pressure of two hundred pounds—it would take about a twenty-inch line to supply that amount of gas. Otherwise, my experience shows that all gas fields go down, and while you have two hundred pounds pressure to-day you might not have two hundred pounds pressure next year. It wouldn't be policy to put a line down which would require a full two hundred pounds when you would be apt to have a lower pressure afterwards. If I were an engineer and designing such a line, I would suggest a twenty-four-inch line to supply that amount of gas to a town of that size. A twenty-four-inch line, supposing that was made of cast iron—a 24-inch line, without counting the rights of way—the actual cost of a 24-inch line out in the country, supposing you had a line reaching the city limits at 24 inches, it would cost you, with the prices which I have just paid for laying a line of that character and have just finished, would cost you twenty-five thousand dollars a mile. If the line was thirty-three miles long it would cost you eight hundred and twenty-five thousand dollars ($825,000). In addition to that, you would have to add the cost of your rights of way and your wells and territory and things of that kind; but, just taking the line alone, that is what the line would cost you. For a town of one hundred thousand inhabitants I would say that the pipeage in the town would average about eight inches, taking it all through, to lay a cast-iron

line of that size, and the cost, according to the prices I am paying at present on the field, would cost you seven thousand dollars a mile. In the town of Toledo, with good paved streets and asphaltum streets, it would probably cost you more, because in Pittsburgh, where I have laid that kind of lines, we have had nothing but cobble-stone, and it was comparatively inexpensive to repave. Then, taking the cost of three hundred miles of city piping, to reach all through the street, at, say, $7,000 a mile, that will cost you about twenty-one hundred thousand dollars, making a total of about twenty-nine hundred thousand dollars; and then to that should be added your wells and incidents and things, which would run it up to over three million dollars ($3,000,000). That is based on a cast-iron pipe of certain weights.

140 38 Q. You refer to cast-iron pipe. Was it not the custom to use wrought-iron pipe in the piping of natural gas heretofore?

(Objected to by defendants as incompetent and irrelevant.)

A. It was the custom, so far as I know, up to within a year or so past.

39 Q. What has been the reason for the change from wrought-iron pipe to cast iron?

(Objected to by defendants as incompetent and irrelevant.)

A. The pipes that we required to put down were so large it was impossible to get wrought iron of sufficient size unless we riveted it up like a boiler, and we found we could put the cast iron in cheaper, and we considered it a better pipe than the riveted pipe.

40 Q. What suggested the necessity of pipe of larger dimensions?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. The decrease in our gas pressure at the field.

41 Q. Will a decreased pressure at the field furnish a larger amount of gas at the city terminus through a larger pipe and more readily than it would through a smaller one?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, a decrease of pressure through a small pipe may get to a point where you can't get any gas at all.

42 Q. I mean will the same amount of pressure through a large pipe furnish gas at a distance more readily than it will through a pipe of smaller dimensions?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

43 Q. Has it been found that a pipe of large dimensions was a necessity owing to the continually decreasing pressure at the well?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; that is our experience. We have abandoned the

small pipes. The small pipes around Pittsburgh are now being taken up and sold for old iron or anything we can get.

44 Q. In estimating the cost of a natural gas plant that you have given have you taken into account that there was a river of from a quarter to a half a mile wide to cross with the pipe?

(Objected to as incompetent and irrelevant by defendants.)

A. I didn't, for I didn't know there was one. I didn't know whether you crossed the river or not.

45 Q. Would the crossing of a river of that kind materally increase the cost of the plant?

(Objected to as incompetent and irrelevant by defendants.)

A. The percentage of the total cost wouldn't be so very much, but making a river crosssing of that kind would be very expensive. It is not possible to lay anything but wrought iron and a screw joint across the river, and we can only get ten-inch pipe that I think is safe. I think that is the largest size I would lay with a screw joint, and to make up the capacity of the twenty-four-inch pipe we would have to lay a number of the ten-inch lines, which would make it a very expensive business.

141 Cross-examination by Mr. KINNEY:

1 Q. Where have you had experience in the natural-gas business aside from the territory you have already mentioned, in Pennsylvania?

A. Up in the—around Oil City. I have looked into that gas field when I was with the Standard or with the National Transit Company, in what is called the Duquesne county gas field, near Wilcox, and in the Allegany county, New York, gas fields, and in the Butler county gas fields; I have had business as an engineer near those different fields; down here at Dayton, in what is their gas field there, thoroughly at one time around the Cranberry Prairie, and I have investigated all the gas fields in the neighborhood of Pittsburgh.

2 Q. How much time have you spent in the Ohio field?

A. What part of the Ohio field—around Dayton?

3 Q. The field tributary to Toledo?

A. Not any; I have not been in it. You mean the Findlay field, I suppose.

4 Q. Yes; the Findlay field—the Hancock county field.

A. No; I have not been to those—that is, what you call the Findlay field.

5 Q. Have you been in any of the Ohio fields except the Dayton field?

A. Only one; and that was down—when Columbus wanted to lay a line they had me look at some territory south of Columbus—that is, the Lancaster gas field.

6 Q. How long since you laid the Pittsburgh line?

A. Six years ago this month when we first commenced to supply gas.

7 Q. The topography of the country in the Pittsburgh field is quite different from what is in the Ohio field, is it not?

A. The general topography, yes, sir. We have some fields—for instance, our Washington county field—we bring into a very level territory; but anything that comes in from the east towards Pittsburgh comes in over a rough country.

8 Q. In speaking of your experience in the use of this natural gas as an illuminant have you had any experience in that line except in and about Pittsburgh?

A. No, sir; I have not.

9 Q. And was that experience confined to the use of it in dwellings or buildings?

A. There it was confined to it in all the different ways we used illumination; for instance, on street lighting. The Low Pressure Gas Company, of which I am president—we supply three or four towns with street lamps; and then for mill illumination and house illumination, and things of that kind, we went all through that subject.

10 Q. Are you using natural gas for illuminating purposes in any way?

A. Yes; in these little towns I am speaking of they have no manufactured gas, and they take that in preference to nothing.

11 Q. In how many towns is it being used for illuminating the streets?

A. There are these four towns I speak of that I am supplying. All together, I suppose, these four places have a total of inhabitants of about ten thousand.

142 12 Q. About what distance from Pittsburgh are they?

A. They are in a radius of five miles from the city; that would take them all in.

13 Q. They are really suburbs of Pittsburgh, then?

A. No; they are not really suburbs; they are towns where manufacturing establishments had been located and gradually filled up around them.

14 Q. How long have they been using natural gas for street lighting?

A. We have been supplying those little places for two years and a half now.

15 Q. Can you tell how large a territory any one gas well will drain?

A. No.

16 Q. What is the limit, then, to the territory from which each well can draw gas?

A. I will not say; I don't know.

17 Q. What would be the difference between the cost of constructing a line such as you have mentioned where cast iron is used than where wrought iron is used?

A. If you used wrought iron you would almost be compelled to use what is called Converse joint pipe, made by the National Tube Works at Pittsburgh. That is the only firm in the world, that I

know of, that makes pipes 24 inches in diameter of that kind, and if you use that pipe the line would cost you a good deal more money.

18 Q. Wrought iron would cost more than cast iron?

A. Yes, sir; not because it is worth more, but they are the only men who make it and they would charge an enormous price for it.

19 Q. What dimensions of wrought-iron pipe are mentioned?

A. Do you mean the lap-welded pipe? When a person speaks of pipe they ordinarily mean that. The largest size is 24 inches, except that in England they make a lap-welded pipe in sections and make it larger, but in this country the actual size is 24 inches. When it comes down to competing mills there are two or three that make 16-inch; when you come down to ten and twelve inch most every mill makes that.

20 Q. Then the highest, where there is competition, is the sixteen-inch?

A. The sixteen is the highest that I know of where there is competition of lap-welded pipe. I speak of lap-welded pipe to distinguish it from riveted pipe, which is being used. The Philadelphia Company, in Pittsburgh, is using lap-welded pipe 36 inches in diameter. That is put together in a furnace and heated to a welding heat, and the two ends are welded. The Philadelphia Company, knowing they couldn't get the size they wanted, took it and welded it together and made it thirty-six inches in diameter; they riveted it like the shell of a boiler and put it together with flanges. They are the first persons who have done that for carrying natural gas. It is not finished yet. The line is, to a certain extent, experimental.

21 Q. How far is your field from which you get your supply from the place of consumption?

A. We have more than one field. Pittsburgh is supplied by
143 the Washington county field, supplied by the Grapeville field, the Marysville field, the Belle Vervon field, the Perrysville field, and the Butler field. All those fields lie about in a circle around Pittsburgh; there is none of them in the same direction. Our average piping distance is about 25 miles; we have as low as twelve miles and we have as high as thirty miles; I don't think any line of pipe coming into Pittsburgh is over thirty miles long.

22 Q. You have a separate line running from each field?

A. There is, without exaggeration, from thirty to thirty-five trunk lines coming into the city of Pittsburgh.

23 Q. You have estimated the amount of gas to be consumed by the city described by Mr. Scott at about sixty million cubic feet per day?

A. Yes; about 60,000,000.

24 Q. I will ask you whether that amount of gas could be furnished through a sixteen-inch pipe.

A. It could if your pressure was—you will understand I stake a supposable pressure of two hundred pounds at the well. If your pressure was high enough you could supply it through a sixteen-inch pipe.

25 Q. How high pressure would be required?

A. That would have to be calculated. I couldn't tell you that without making a pretty long calculation.

26 Q. What would be the expense, according to your estimate of the construction, of a sixteen-inch wrought iron pipe from the field to the city, taking the distance as given by Mr. Scott?

A. I don't know exactly what you would have to pay for sixteen-inch pipe—wrought-iron pipe—to-day. The last I laid I paid ninety-seven cents a foot for laying it, and that would be about five thousand dollars a mile for the labor of laying it. We paid, I think, two dollars and sixty cents a foot for it. I guess it is higher than that now. Say it is the same price, that line would cost you in the neighborhood of eighteen thousand dollars a mile to lay it.

27 Q. What would be the cost per foot for laying twelve-inch pipe in the streets of the city?

A. Twelve-inch pipe of what kind?

28 Q. Wrought.

A. Nobody lays wrought iron any more in the streets of a city. I have not done that for years, that I know. We don't lay it; it is too expensive. You can lay that a great deal cheaper with cast iron.

29 Q. Give us both.

A. I am not familiar with the late quotations of that sized pipe. If it was ten-inch you would pay a dollar and a half a foot. I don't know exactly what the quotations of twelve-inch are.

30 Q. Can you give us what cast-iron twelve-inch pipe would cost per foot in the city for laying it?

A. It would cost you—I am laying the same now. I closed a contract yesterday for laying a lot of that same pipe, and it cost me thirteen thousand dollars a mile; that is a little over two dollars a foot. That is without paving. Take the streets of Toledo, that would add very materially to the cost of that. I suppose that that would add, at a very low calculation—that would add a thousand dollars
144 a mile to the cost of it. That would make it about fourteen (fourteen) thousand dollars.

31 Q. Do you mean that the difference between the cost of laying in the street where there is no pavement and a street where is a pavement would be about a thousand dollars a mile?

A. Yes, sir; with your pavements—block pavements. They are difficult to put back and expensive to put back.

32 Q. I wish you would give that estimate on an eight, a six, and a four inch pipe, if you can, per foot or per mile.

A. My estimate on the eight-inch would be, taking the cast iron—would be about seven thousand dollars a mile. That would be a low estimate.

33 Q. With or without pavement?

A. I base it on the character of the pavements we have in Pittsburgh, and that is principally cobble-stones. We have no asphalt pavements. To lay six-inch pipe in Pittsburgh it costs me about forty-five hundred dollars a mile; that is also cast iron. When we get below six inches we always lay wrought iron. To lay four-inch pipe—I believe four-inch to-day is worth about thirty-one cents—

well, I will say it would run between twenty-five hundred and three thousand dollars a mile to lay four-inch.

34 Q. Supposing fifty million cubic feet of gas would be all that would be necessary, what difference would that make in your estimates, if any?

A. It would just decrease it that much.

35 Q. In what proportion—what proportion does the cost bear to the amount of gas?

A. Of course the cost, you will understand, in the supposable case was very much greater in proportion to the amount of gas you received, owing to the great number of houses and the great amount of the pipeage compared to the amount. You had to lay three hundred miles of pipe for a very small amount of gas, and that makes the proportion between the two very great in the cost. If you take that same gas, and say you only use fifty million feet, how much of that mileage would you take off?

36 Q. I mean with the same mileage.

A. With the same mileage of piping in the city you decrease the diameter of the trunk line out to the wells. It might be a twenty-two or a twenty-inch line that you could use under those conditions. I couldn't say exactly without figuring it out.

37 Q. What is the ratio of expense to the size of the pipe? For instance, a pipe of, say, twenty-four inches will cost a given amount. Now, in what proportion does that decrease, that cost decrease, as the pipe decreases in size?

A. That I couldn't tell you; I never figured it up in that way. I have laid most every size of pipe, and have had my bids, and I have just figured by actual figures what it has cost me to do that work. I couldn't answer that question.

38 Q. Your estimates are based upon what you have paid for pipe?

A. Yes, sir; upon what I am paying to-day and what I have paid.

39 Q. There would be a difference, would there not, in the cost of constructing a pipe line through a hilly or uneven territory and a practically level country?

A. Yes, sir.

145 Re-examination:

1 Q. In estimating the cost of this piping of a city you have estimated the cost simply for the street lines and have not included what are known as the service pipes?

(Objected to as incompetent and irrelevant.)

A. No, sir.

2 Q. What is the prevailing price for gas for use in houses in the city of Pittsburgh?

(Objected to by defendants as incompetent and irrelevant.)

A. Ten cents for a thousand feet net and no discount.

3 Q. How is it measured?

(Objected to as incompetent and irrelevant.)

A. It is measured by meter; they make no contracts in Pittsburgh now except by metre.

4 Q. Does this prevail to the manufacturers there also?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir.

5 Q. How is the price regulated to the manufacturers?

(Objected to by defendants as incompetent and irrelevant.)

A. We charge by the work that is done. We based our charge originally upon the amount of coal they consumed. We took their coal bills from their books and then either charged them more or gave them a slight reduction, but that was the basis of the charge; the number of bushels of coal they used in any mill we took that as our basis.

6 Q. What is the cost of gas as charged by you, based upon coal, now?

(Objected to by defendants as incompetent and irrelevant.)

A. We have made a great many calculations to find out at what price per thousand we were giving per thousand by metre, and we figured it up that the mills in Pittsburgh are paying less than two cents per thousand feet, basing that calculation on the fact that a thousand cubic feet of gas is equal to one bushel of bituminous coal.

146 Also EDWIN SQUIRE, a witness of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.

A. Edwin Squire; about forty-six years; I now reside in Oil City, Pennsylvania. I have been a civil engineer. I have not been doing very much civil engineering during the last six or seven years. I sometimes do a little of that work, but I have paid special attention to the natural-gas business, especially the theoretical part of it—that is, the studying of the flow of gases through pipe lines and of the consumption of natural gas—the burning of it.

2 Q. Have you had any experience in the drilling of wells?

A. No, sir; that is, I do not do that kind of work; I have seen it done some.

3 Q. Are you familiar with the work?

A. In a measure; I am; yes, sir. I don't often stay around the wells. I don't stay around the wells a great while at a time because I consider it a dangerous place to be, and as long as my business don't take me there I keep away.

4 Q. You may now give your knowledge, as acquired from the experience you have had, as to the use of natural gas as a fuel or as an illuminant, either—what experience you have had in this business

(Objected to as incompetent and irrelevant by defendants.)

A. I have burned natural gas in my own house both as a fuel and as an illuminant, to a certain extent. I have had the misfortune to live in a small town, where only part of the streets were piped for coal illuminating gas, and the street on which I happened to live has no illuminating gas main and the illuminating gas company is not rich enough to build one; so I burned natural gas to some extent in there, together with petroleum oil, for lighting. I have had considerable experience and made quite a good many experiments in burning natural gas as a fuel under steam-boilers and under oil stills. The company with which I am connected sometimes have furnished natural gas to different manufacturing establishments as well as to domestic consumers—that is, the company with which I was connected—the United Pipe Line Company—a division of the National Transit Company.

5 Q. Have you knowledge of the power of natural gas as an illuminant compared with other illuminants usually used in towns and cities?

A. Yes, I have made some tests with photometres on the natural gas we have at Oil City, and I have observed the lighting effect of natural gas in other places.

6 Q. How does natural gas compare with common illuminants as a lighting power?

(Objected to by defendants as incompetent and irrelevant.)

A. I can only compare it with coal gas from measurements made by myself. I have never measured the illuminating power of electric lights or petroleum oil, except as it furnishes a light for read-
147 ing purposes or such work as that. I will say that the natural gas which we have in Oil City is about eight or nine candle-power, as it is reckoned, while ordinary coal gas has a candle-power of about fifteen or sixteen. I have found using an Argand burner for burning the natural gas in my house, by using two Argand burners burning together about ten cubic feet per hour (that is the quantity on which the illuminating power of gas is usually based) that it don't furnish nearly as good a light for reading as an oil lamp burning, perhaps, at the rate of a pint in four or five hours.

7 Q. What is the most practicable use of natural gas in its natural condition?

(Objected to by defendants as incompetent and irrelevant.)

A. It makes a very fine fuel. Almost everybody I have ever heard express an opinion considers it a fine thing to use for domestic purposes in stoves and grates. It is a fine thing to use under steam-boilers and many other purposes, because it is so easily regulated; but, as an illuminant, I don't think it is a success. The streets of Oil City are lighted with natural gas. They have what are called torches there, that burn fifty or sixty cubic feet of natural gas in an hour—about as much as an ordinary stove. When the wind is not stirring much it makes a pretty good light, but it smokes a good deal. If the wind is blowing hard the gas blows out.

8 Q. It is a waving and flickering light, too, is it not?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; it is due to the fact that it requires a much higher temperature to burn the gas than it does with coal gas; that makes this flickering, and then the liability to blow out.

9 Q. I wish you would detail your general experience in the use of natural gas. What experience have you had in an official way or as a private individual?

(Objected to by defendants as incompetent and irrelevant.)

A. I have had experience in an official way. The general manager of our company directed me—I was directed to study the natural-gas business, and in order to do that I studied the illuminating gas business through publications devoted to those interests, with a view to getting all the information I could and keeping up with the times. The company with which I was connected were using or furnishing natural gas to use in Pittsburgh. They were using quite large quantities of gas under steam-boilers for generating steam to run their pumping engines all through the oil country where they could get natural gas, and eventually they extended their lines to a long distance to reach all of their pumping stations.

10 Q. How long have you been in the natural-gas business?

A. Between six and seven years, since I was directed to make that my study and since I did make it my study.

11 Q. And has that been your business ever since?

A. Yes; that has been my special business, although I have sometimes taken up other matters as I have had opportunity—that is, as I have had time.

148 12 Q. Has your experience in the natural-gas business shown you whether natural-gas wells are continuous in their product, or whether from a continual draft upon them they are exhausted, or not?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; I have had opportunities for getting a knowledge of that in some fields.

13 Q. What has your experience taught you in reference to that?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. It has taught me to believe that all gas fields, with considerable use, will eventually fail. Some of them, as I know, have failed already.

14 Q. Have you ever known a gas well under continual use that would maintain its original flow when first tapped?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir.

15 Q. And have all gas wells, so far as you know, under continual use and draft diminished their pressure and the amount of their flow?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

16 Q. You know no exception to this as a general rule?

(Objected to by defendants as incompetent and irrelevant.)

A. I do not.

17 Q. Have you any knowledge of the cost of constructing a natural-gas line?

A. Why, I wouldn't set myself up as an expert. I never had charge of that part of the business and my knowledge of the cost has been obtained by hearsay and hearing men who were in the same office talk about it—men who have charge of that business—and I have sometimes asked them for information. I have had occasion to make estimates and have asked the men who did the work, who were familiar with it and familiar with the cost. I have asked them questions and they have told me, but I never have paid the bills or looked over the books.

18 Q. Did you hear the testimony of Mr. Hartupee, who has just testified in this case?

A. Yes, sir.

19 Q. From what you have heard and the knowledge that you have of the cost of construction of a natural-gas plant, are you able to state whether his figures are approximately correct or not?

(Objected to by defendants as incompetent and irrelevant, and also that the witness has not been shown to be competent to answer the question.)

A. I will say, from my knowledge of the quotations for cast-iron pipe and from some knowledge of the amount of work required to lay a pipe of that size and weight, it would be my opinion that his estimates were not far wrong. I disclaim having the precise knowledge that Mr. Hartupee has as to the cost of such things.

20 Q. His information in regard to such things is more accurate than yours?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; I am satisfied that it is. He has been right in the field, especially in constructing such lines as he testified to—these large lines.

21 Q. Has your experience in these matters shown you
149 whether an enterprise originated for the purpose of constructing a natural-gas pipe line to supply a city with natural gas, to be furnished for domestic use and also for manufactories, is a hazardous, uncertain, and speculative enterprise or not?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Yes, sir; I have had information that has led me to conclude very decidedly that such is the case; that it is a hazardous and speculative business.

22 Q. What are the elements of uncertainty and hazard in an enterprise of that kind?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. I have known that large gas lines in many cases failed within a very limited time; indeed, so that they have to be abandoned, and that in other cases, where they last a few years—that is, where the gas is drawn off at a slower rate and where the salt water don't get into them—they last longer. Still, it has been my experience that they all do fail, so far as I have had information. They all do fail, and usually with considerable rapidity.

23 Q. You have spoken of salt water. Should that appear in a gas field or in a gas well what effect has that upon the well as a producer to a gas pipe line?

(Objected to by defendants as incompetent and irrelevant.)

A. I should expect the well to fail very soon after the salt water appeared in the well.

24 Q. Is that the universal experience, so far as you know?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Yes, sir.

25 Q. This salt water appearing in the well is an indication of the failure of the well as a gas well?

(Objected to on the part of the defendants as incompetent and irrelevant.)

A. Yes, sir.

26 Q. Has your experience and observation in the natural-gas business qualified you to state with some degree of certainty what amount of territory would be necessary to supply a city of ninety to one hundred thousand inhabitants with natural gas for domestic purposes and the ordinary manufacturing interests that would attach to such a city?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Why, I would have an opinion about that; still I would know that fields differ considerably in their lasting qualities and in the amount of gas that would be furnished per square mile; so that, of course, an estimate might be wrong either way.

27 Q. You can give in a general way what your experience has taught you in reference to that—I mean would one acre do or would ten acres do, say, for a supply for ten years?

(Objected to as incompetent and irrelevant by defendants.)

A. Taking the fields with which I have been best acquainted as a criterion, I would say that if it was designed to furnish the city for ten years—say to make it tolerably safe for ten years—that the company should control at least a hundred square miles of territory.

28 Q. Would you think that ten thousand acres would be sufficient

in amount for a city to have control of under any circumstances to supply them for ten years?

(Objected to by defendants as incompetent and irrelevant.)

150 A. No, sir; there is no territory with which I am acquainted that has been tested for a sufficient length of time so that we can determine what the loss is—how rapidly the gas is failing; no territory of sufficient power to justify the belief that ten thousand acres would supply a hundred thousand people for ten years.

29 Q. I will ask you again, although you may have answered the question from your experience, what is the special use and most practicable use to which natural gas is or can be put?

(Objected to by defendants as irrelevant and incompetent.)

A. To domestic use—that is, for heating residences, stores, and for cooking purposes.

30 Q. And as an illuminant how is it?

(Objected to by defendants as incompetent and irrelevant.)

A. I think I answered that; that I didn't consider it a success.

Cross-examination by Mr. KINNEY:

1 Q. Mr. Squire, what company or companies have you been connected with in the natural-gas business for the last six or seven years?

A. I am employed by the United Pipe Line Division of the National Transit Company. Their headquarters are at Oil City, Pennsylvania, although they have offices in New York city, I believe.

2 Q. And they supply gas to what places mainly?

A. At present I don't know as the United Pipe Line are supplying any towns. They did when I first began to study the business. They were supplying some small towns with gas as well as supplying their own pumping stations.

3 Q. What natural-gas territories have you been familiar with?

A. I have been most familiar with the natural-gas territories in the vicinity of Oil City. I have visited several times other gas fields—in Duquesne Co., Pa., and in Beaver county, Pennsylvania, and the Moreysville field, which supplies Pittsburgh, and has for several years; and I visited, about two years ago, a field in the vicinity of Fostoria, Ohio. The gas from that field comes to this town, I think.

4 Q. How much time did you spend on the Ohio fields?

A. Three or four days, I think it was.

5 Q. Have you had any further experience in the Ohio fields?

A. Not any very large experience. I was not paying any particular attention to gas at any time. I was at Lima, Ohio, about a month ago. I was there a week, and saw them burning natural gas at that place.

6 Q. What particular attention did you pay to the natural-gas field when you were at Fostoria?

A. My business there was to measure, to gauge, some of the gas wells in that territory and take the specific gravity of the gas and smell of it, and so forth.

7 Q. Have you had any experience with natural gas as an illuminant except at Oil City?

A. Yes. I saw it burning at Fostoria and at Lima also.

151 8 Q. Where was it being used in Fostoria for street-lighting purposes?

A. They were burning it for street lighting and also for lighting the offices, I think, in some places.

9 Q. Was it the same way at Lima?

A. Yes, sir; to a limited extent. I didn't see very much of it being burned at Lima.

10 Q. And your tests that you made to determine the comparative merits of natural gas and artificial gas as an illuminant were all made in Pennsylvania with Pennsylvania gas, I suppose?

A. Yes, sir; my tests with instruments were all made at Oil City, I think.

11 Q. If I understand you correctly, you estimate that the illuminating power of natural gas per thousand cubic feet is about one-half the illuminating power of artificial gas per thousand cubic feet. Is that correct?

A. Yes, sir.

12 Q. Do you know how large a territory a gas well draws from?

A. I don't know.

13 Q. Do you know whether or not all gas wells draw from the same amount of territory?

A. I do not.

14 Q. You have stated that you have not known a gas well in continuous use to maintain its original pressure?

A. Yes, sir.

15 Q. Now, suppose that a gas well has been in continuous use for a certain period of time until the pressure has become less than it originally was, and that gas well is then closed up and allowed to rest for a period of time and then opened again, can you state whether or not the pressure then, when it is reopened, will be more than it was when it was closed at the end of the use?

A. They don't all act alike in that respect, but usually, if they are closed off before water gets into them to shut the gas off, the pressure will increase somewhat for several days, perhaps.

16 Q. How soon will it approximate to its original pressure—how near will any of them that you have had any experience with come back to their original pressure?

A. That varies materially. I have known of some that didn't come back so that you could get any pressure of practical value, while others that had been closed for a few weeks could be turned into the line again and furnish gas for awhile, but usually they don't amount to a great deal, from my observation. For instance, if there are a thousand or a hundred wells connected with the same system of lines, it is found that a well when closed in that the pressure don't rise above the pressure of the gas line, then they conclude that

it is not furnishing any gas, and I know some men who are in charge of wells — are in the habit of closing them in order to prevent the stronger wells from going back into the ground. Sometimes the pressure rises again, so that they turn them in again, or it may be that the pressure on the adjoining wells fails sometimes, so that the pressure on the pipe line to which they are connected becomes less than the pressure on the well which was closed in.

152 17 Q. There is a great difference, is there not, in the time in which a well will show a decrease or loss in the different wells?

A. Why, there is a considerable difference of time. I know of one case—I found one case down in the Fostoria field that was very peculiar in that respect. Usually the wells—the pressure will raise to about what it will become within a few days, and usually within a few hours will go up to within a few pounds of what it will eventually become.

18 Q. The life of different wells is different?

A. Oh, yes, sir; I didn't understand your question.

19 Q. Sometimes wells, I suppose, will become exhausted in comparatively a short time?

A. Yes, sir.

20 Q. And others continue to furnish gas for a long period of time?

A. Yes, sir.

21 Q. In fact, I suppose a good many wells which are dug furnish no gas at all, and some furnish a little, but not enough for practical use?

A. Yes, sir.

22 Q. So that it depends very largely on the well to determine what amount of gas will be furnished from it, and in order to determine what amount of gas will be furnished from a well you must know the well?

A. Yes, sir.

23 Q. And, in order to determine the amount of time that that gas will be likely to last, to make any reasonable estimate, you must be familiar with the well?

A. You must be familiar with the territory; it must have been tested for some time before one can form a reasonable opinion—that is, reasonably form an opinion as to the probable life of the field.

24 Q. How much experience have you had in the amount of territory necessary to furnish sixty, seventy, or one hundred million cubic feet of gas?

A. That is so many cubic feet of gas per day?

25 Q. Per day; yes, sir.

A. I would say that I know very few fields—that is, I am not personally acquainted with very many fields that I think would do that. Judging from the gas that is being supplied from the fields with which I am most acquainted, I would say, as before, that I would consider that it should cover at least one hundred square miles.

26 Q. To furnish how much gas?

A. Sixty million cubic feet a day.

27 Q. And those fields that you are most familiar with, I understand, are around in Pennsylvania?

A. Yes, sir; I am most familiar with those Pennsylvania fields.

28 Q. Do you know how much gas is being actually furnished from any good field in Pennsylvania?

A. I know pretty closely, especially in one field.

29 Q. What field is that?

A. I think I know more about it than anybody else. I have just been making some calculations for another purpose, but not in connection with this at all, because I didn't know until to-day that I was going to be asked any questions of that kind. I refer to the field which supplies Oil City and the towns adjoining.

153 30 Q. And is it from that field that you mainly draw your conclusions as to the amount of territory necessary to furnish a given amount of gas?

A. I wouldn't say mainly. I would say that I have the best knowledge as to the amount of gas that is being furnished; but, then, I have got ways of knowing what the probable amount of gas is furnished by different fields from measuring the flow or capacity of different wells—the capacity of a well when it is burned by itself so — to measure the flow individually. I have compared different fields in that way. I also have some considerable knowledge of the amount of—that is, the number of metres and stoves that are being supplied to different towns by those fields outside of those where I have actually measured any of the wells.

31 Q. You say that this natural gas is best adapted to domestic use or heating purposes. Do you include in that all heating uses—that is, for private residences and public buildings and manufacturing establishments—or do you confine that domestic use to its narrow term of residences?

A. I would say that I consider natural gas worth considerably more per thousand feet or per unit volume for domestic purposes—that is, for cooking and for heating private residences or in small buildings, offices, shops, or stores, and that kind it is worth much more, I think, than it is for generating steam or for use under steam-boilers.

32 Q. It is used very extensively under steam-boilers, is it not?

A. Yes, sir.

33 Q. And for pretty much all manufacturing purposes, is it not?

A. Yes, sir.

Re-examination:

1 Q. Why do you say it is best adapted to domestic use? I mean by that referring to the expense of it. Has it been found too expensive for manufacturing purposes and for under steam-boilers? Is that the reason you say it is more especially adapted for domestic use?

(Objected to by defendants as incompetent and irrelevant.)

A. I can say that I consider it worth much more per given volume per thousand feet, for instance, for domestic purposes than for manufacturing purposes where I have seen it used, and for this reason, on account of the convenience of its use and its cleanliness as compared with coal. It is, in my estimation, worth considerably more for domestic purposes than a householder would have to pay for the amount of coal to do the same amount of heating, on account of the convenience and cleanliness, while under steam-boilers it is not worth so very much more, except on account of the labor of shovelling it and hauling out the ashes, because a manufacturer don't usually figure on the freedom from dirt and smoke, which the householder usually does.

2 Q. Cleanliness is not such an element to manufacturers as to householders?

(Objected to by defendants as incompetent and irrelevant.)

154 A. No, sir; and aside from that there is a greater waste of heat in the use of coal for domestic purposes than where it is properly used for generating steam, while that waste may be largely avoided in the use of gas for domestic purposes.

3 Q. From the experience you have had in the Ohio field that you acquired in and about Fostoria and Lima did you observe anything to show you that the natural gas of that field is different in any material respect from the natural gas in the Pennsylvania field?

(Objected to by the defendants as incompetent and irrelevant.)

A. Yes, sir; I did.

4 Q. What is the difference?

(Objected to by defendants as incompetent and irrelevant.)

A. The only thing that I tested myself was the odor of it, the only thing that I measured myself. If you will allow me to say what I have gathered from reading the report of the State geologist I might tell you what my opinion is based on—based on that report and the reports of others, chemists who have analyzed it, that it contains compounds of sulphur, which are considered, especially for illuminating purposes—for inside illuminating purposes it is considered objectionable, I think, by all gas engineers.

(Answer objected to on the ground that the witness is stating hearsay matters and is not shown competent to speak as a witness on the subject.)

5 Q. State whether your knowledge of natural gas would lead you to change your opinion and the results which you have given us heretofore in regard to the Pittsburgh and Pennsylvania natural gas, the general results as to the durability of wells and the general results as obtained from using it.

(Objected to by defendants as incompetent and irrelevant.)

A. I have never visited the Fostoria field but once. I may say

that I have received reports from the man who has charge—that is, he has reported to me sometimes the pressure of wells there, asking me to calculate the flow from the same wells, and I have observed that they failed—some wells that I measured when I was there—that they were failing in the amount of gas furnished after a time.

6 Q. How does the failure compare with the failure which you observed in the Pennsylvania field?

(Objected to by defendants as incompetent and irrelevant.)

A. So far as I was able to judge, they were failing at about the same rate as—well, for instance, what is called the Duquesne County field—is not failing as rapidly as the Beaver County field, the Sheffield field, the large wells that had to be abandoned within a year after they had begun to use gas from them. The wells in that Duquesne County field can be used—that is, they don't take off all the pressure; they carry quite a high pressure there, several hundred pounds, and the wells, some of them, have been furnishing gas four or five or six years, but at a decreased pressure. They have separate lines by which these old wells are connected, and that is called a low-pressure line, and furnishes gas nearer by, while the other gas wells, with a higher pressure, furnish gas to the longer points.

155 7 Q. State whether your knowledge of the Ohio field would lead you to infer that the decrease would be the same that is generally found in other gas territory that you are more thoroughly acquainted with.

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; I should expect and am satisfied that through a part of this Ohio field, at least, from reports that I have had, that the wells are failing and will fail. I have not had reports sufficiently detailed to enable me to calculate how long those wells may last—that is, how many years.

Recross-examination:

1 Q. All your knowledge in reference to the failure or decrease of the pressure of the Ohio wells is from information obtained from somebody else?

A. Yes, sir.

2 Q. You don't know anything about it from your own knowledge?

A. No, sir; not of my own measurements, except as I said, I measured quite a number of those wells about two years ago.

Also L. F. BARGER, a witness of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. My name is L. F. Barger. I am forty-five years of age; reside in Youngstown, in this State; occupation, superintendent of the

Mahoning & Lawrence Natural Gas Co., and have charge of their business.

2 Q. Will you please state what experience you have had in the use of natural gas and the piping of it to towns and cities for use as a fuel and as an illuminant, if it is so used in any way?

A. Well, I have had four years experience directly with the gas business—that is, my attention has been directed solely to the natural-gas business for the past four years. Prior to that time I had general knowledge of it, acquired from a residence of about thirteen years in the oil country, where I was part owner of a number of wells which were producing oil and gas, and was generally among it and knew something about it.

3 Q. How does the natural gas compare as an illuminant with other illuminants, with reference to its lighting power?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, it is a poor illuminant as compared with most any other light that I know of. It has only one desirable quality, and that is its cheapness. It burns with a sickly, yellow flame, giving out an intense heat and usually a quantity of carbon.

4 Q. Has your knowledge of the natural-gas business qualified you to state whether the business of piping it from a distance, to towns and cities to be used by the inhabitants for domestic
156 purposes and for manufacturing purposes, is or is not an uncertain, hazardous, and speculative enterprise?

(Objected to by defendants on the ground of incompetency and irrelevancy.)

A. I think it is all that.

5 Q. Is your knowledge of that sufficient to be able to state whether it is or not?

(Objected to as incompetent and irrelevant.)

A. From my experience, yes—that is, so far as my experience will warrant the assertion, I think it is a hazardous, doubtful, and uncertain speculation.

6 Q. What are the elements of uncertainty and hazard in an enterprise of this kind?

(Objected to by defendants as incompetent and irrelevant.)

A. The impossibility of counting for any length of time upon your supply lasting. It costs a great deal of money to put a gas plant into operation, and before you get your money back there are very strong chances that you will have little or no gas—that is, so far as my experience goes.

7 Q. And your experience extends over how many years?

A. Four years, directly in the natural-gas business, and for nine years—when I first noticed it being used was nine years before that, when I first noticed its being used as a light or illuminant and for fuel purposes.

3 Q. You may illustrate that by any examples that you have knowledge of—of its failure.

(Objected to by defendants as incompetent and irrelevant.)

A. Well, the Mahoning Gas-Fuel Company, whose business I now have charge of, built their gas lines to a field forty-five miles away, in the New Sheffield, in Beaver county, Pennsylvania, and that field is utterly and entirely exhausted, and, I think, lasted less than two years.

9 Q. When that plant was first constructed did you have a sufficient flow of gas?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

10 Q. And when it was first struck were there any indications that there would be a failure within the time you have mentioned?

(Objected to by defendants as incompetent and irrelevant.)

A. There were not.

11 Q. Are there are any means of determining from the first flow of gas from a well whether it will be continuous or whether it may be exhausted soon or not?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, that is a difficult question to answer. It depends upon many circumstances. You might get a well with a large rock pressure which would warrant you in believing it would last some considerable time, yet it might be drowned out with salt water in a very short time.

12 Q. Have the most sanguine expectations, within your experience, been disappointed?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes; I think so. I think the gas business generally is a failure—the natural-gas business. I have no faith in it at all.

13 Q. Has your past experience qualified you to state what the price of a natural-gas plant would be if sufficient details were given you?

157 A. Well, I of course could say what the cost of such a plant as I have charge of would be; but then I have no practical knowledge of the laying of a gas line, not having laid one.

14 Q. Did you hear the testimony of Mr. Hartupee here this evening with reference to the cost of constructing a natural-gas plant?

A. Part of it; yes, sir.

15 Q. Can you state whether his estimates were substantially correct or not?

(Objected to by defendants as incompetent and irrelevant.)

A. As regards the small pipe—the wrought-iron pipe—I think yes, but my knowledge of the cost of a gas line is based on lines

built some time prior to those of which he speaks, and the gas business then was in a cruder state than it is in now. We had no knowledge of the using of a cast-iron pipe of a larger diameter at the time that my knowledge reaches of a gas plant.

16 Q. Can you, from your knowledge, state whether a natural-gas well from which there is a continuous draft will decrease in the quantity of its supply or not?

(Objected to by defendants as incompetent and irrelevant.)

A. It will decrease.

17 Q. In your experience, have you ever known any variation from that, as a rule?

(Objected to by defendants as incompetent and irrelevant.)

A. I have not.

18 Q. I understand you, then, to say that to all gas wells there is a limit to the life of them as gas-producers?

(Objected to by defendants as incompetent and irrelevant.)

A. All that I ever knew of. There might be something outside of my knowledge, but I never have heard of them.

19 Q. Have you read the reports and the general literature of the natural-gas world throughout the United States?

A. Yes, sir; to a certain extent I have.

20 Q. Have you ever heard of any field, outside of the one that you reside in, where this general rule that you speak of has been varied from?

(Objected to by defendants as incompetent and irrelevant; also as calling for hearsay testimony.)

A. I have not.

21 Q. What is the real, practical use of natural gas?

(Objected to as incompetent and irrelevant.)

A. Well, I consider it the best fuel in the world.

22 Q. And where it is used what is the general use to which it is put and can be best put?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, the best use that it can be put to would be in domestic services of heating and cooking. It is used in manufacturing, but I do not think it is desirable to allow it to be used in manufacturing.

23 Q. What are the objections to using it in manufacturing?

(Objected to by defendants as incompetent and irrelevant.)

158 A. Well, principally its certain extinction, and the larger — you make on your gas field the shorter it will last. The manufactory, particularly the rolling-mill, uses a very large quantity of natural gas as a fuel, and they do not pay for that in proportion to the service rendered.

24 Q. Do I understand you to say that it is too expensive to be

used in the lavish way that manufacturing establishments would be compelled to use it?

(Objected to by defendants as incompetent and irrelevant.)

A. No; it is too scarce to be used in the lavish way that manufacturers use it, because manufacturers don't pay a high price for it.

25 Q. I mean too valuable?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; that is it precisely; it is too valuable to be used—there is not enough of it to warrant its introduction into a rolling mill.

Cross-examination by Mr. KINNEY:

1 Q. Your experience, as I understand you, in the natural-gas business has been confined to the Pennsylvania field, has it not?

A. Yes, sir; to the Pennsylvania fields—that is, I have no practical knowledge of others.

2 Q. Your company supplying gas to Youngstown draws its supply from Pennsylvania?

A. No; oh, no; they supply the towns of Poland, Middletown, Petersburg, and also a number of others.

3 Q. I intended to ask whether your company that supplies gas to Youngstown drew its supply from the Pennsylvania fields?

A. Yes, sir.

4 Q. How long have they taken out gas from the Pennsylvania field, to your knowledge?

A. I think about thirteen years or a little over. They have been using it for various purposes; but don't understand me to say that they have been using it in the way they are now using it—that is, bringing it from long distances to supply large cities; it has been used for supplying boilers for pumping and drilling and in houses a short distance from the gas line for about thirteen years.

5 Q. How long has it been used in Pittsburgh?

A. I can't say that; I don't know. I have seen it used longer than that as a substitute for steam, and they ran it into the cylinders of their engines and ran machinery with it; where the pressure was sufficiently strong they dispensed with the boiler altogether.

6 Q. It is a fact, is it not, that a very large amount of capital is being continuously put into this business now?

A. I don't know that.

7 Q. You are not familiar with any lines that are being or have been recently constructed in the Pennsylvania field?

A. No; I don't know of any in the Pennsylvania field, excepting where they are extending their lines in order to reach new fields, and enlarging them in order to accommodate the low pressure in those fields; and in one other instance where they are piping two or three small towns, about thirty miles from Pittsburgh; that is a small enterprise. They are getting their gas from a small
159 pool of gas which they recently struck there; it is not a very extensive nor a very expensive plant; and the other opera-

tions I think are all confined to enlarging their lines to accommodate the reduced pressure and extending their lines to other fields.

Mr. SCOTT:

8 Q. For what purposes—to get more gas?

A. Because the supply from where they are drawing it is becoming exhausted. If you can't bring your wells to your lines you must put your lines to your wells. It is life or death with the gas companies.

Mr. KINNEY:

9 Q. Of course to keep up the supply. What experience have you had in the use of natural gas for street-lighting?

A. I have been connected with a gas company that furnished gas for street-lighting.

10 Q. Where was that?

A. In Oil City. I have lived in a number of towns where it was used for that puppose.

11 Q. Is the use of it being continued in these places or in any of them for that purpose?

A. I think it is; yes, sir; but I am not positive, because I have not been there for some little time.

12 Q. So far as you have expressed or given an opinion as to the cost of constructing these lines, I understand that you have based that opinion on your experience?

A. Yes, sir.

13 Q. In constructing lines some years ago?

A. No; I have not given any opinion as to the cost. I said that I could tell what a line cost some years ago, but that they don't lay those kinds of gas lines to-day.

14 Q. So far as you have expressed an opinion, it is based upon your experience in constructing a line some years ago?

A. Yes—well, not in the practical construction of the line myself, but in disbursing the money to pay for the construction of the line, in writing checks, in other words, to pay for it.

15 Q. And you have had no experience of that kind recently?

A. Not since last winter.

Re-examination:

1 Q. Can you express an opinion, from the knowledge that you have of natural gas and natural-gas wells and natural-gas territory, as to the amount of territory that would be necessary to supply a city of the size of Toledo—say that it has a population of from ninety thousand to one hundred thousand inhabitants—for a period of say, ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. No; I could not; I couldn't say. I could say to you that I can tell you how far apart the gas wells should be drilled, in my opinion—how far apart they should be placed in order to make them last at all without interfering with one another, but as to the quantity

of gas necessary to supply this town with gas for ten years, I couldn't say.

2 Q. What distance apart should they be placed?

(Objected to by defendants as incompetent and irrelevant.)

160 A. We drill our gas wells at from three-quarters to a mile apart to prevent them from interfering with one another, and we find that their life is short at that.

3 Q. Suppose that the city of Toledo would require fifty million cubic feet per day, about how much territory should they have to give them a reasonable supply for ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, it would depend upon the distance of the line. It would depend upon the rock pressure and the kind of territory.

4 Q. Taking the territory and rock pressure and lines that you are familiar with, would you give some general idea of the amount of territory that would be required to probably insure a fair supply of gas to the city for ten years?

(Objected to by defendants as incompetent and irrelevant, and also that the witness has not been qualified by showing any knowledge of the subject.)

A. I don't think I could. It is so outside of my ideas in this gas business—so far ahead of anything I ever anticipated in the gas business—I couldn't possibly answer your question. I don't believe myself that there will be any such thing as a natural-gas line supplying this city ten years from now.

5 Q. From the knowledge which you have, do you think ten thousand acres would do it?

(Objected on same ground as preceding question.)

A. No; I don't believe that ten thousand acres would do it.

6 Q. From as good territory as you have knowledge of?

(Objected to as above.)

A. No, sir; I don't think it would do it.

Recross-examination:

1 Q. Your idea, if I understand you, is that the chances are in favor of a practical exhaustion of the natural gas in ten years?

A. That is my idea, so far as the cities that are now being supplied with it. There is every possibility of their discovering fields that are so far remote that it would be impossible for you to get the gas through the lines; but so far as the cities using it now, in ten years from now I don't believe they will have an ounce of gas in their lines. I have had knowledge of a good many gas fields in my time, and some of the very largest, where they used the gas and turned it into the cylinders of their engines because the pressure was so great, and they don't exist in name even to-day. It would be impossible for me to go and locate them even. I can say to you

that twelve wells from which the Mahoning Company is drawing gas are not giving in the same field as much gas as six did last year.

161 Plaintiffs further introduce in evidence papers and documents as follows:

A certified copy of a warranty deed from Jesup W. Scott and wife to John B. Carson, recorded in volume 76 of the record of Deeds of Lucas county, Ohio, March 8, 1873, on page 133; attached hereto, marked Exhibit No. 1.

Certified copy of warranty deed from John D. Crennan and wife to John B. Carson, recorded in the recorder's office of Lucas county, Ohio, November 30, 1870, in volume 65 of Deeds, page 485; attached, marked Exhibit No. 2.

Certified copy of warranty deed from Frederick Prentice and wife to Horace F. Clark, recorded in the recorder's office of Lucas county, Ohio, June 7th, 1872, on page 363 of Deeds; attached, marked Exhibit No. 3.

Certified copy of quitclaim deed from Maria Louise Clark and others to Augustus Schell, recorded in volume 93, page 298, of Deeds, in the recorder's office of Lucas county, Ohio, February 7th, 1876; attached, marked Exhibit No. 4.

Certified copy of trustee's deed from Norman C. Baldwin, trustee, to Wallace Andrews, trustee, recorded in the recorder's office of Lucas county, Ohio, November 6, 1879, in volume 109 of Deeds, page 26; attached, marked Exhibit No. 5.

Certified copy of quitclaim deed from Thomas C. St. John and wife to Wallace C. Andrews, recorded in the recorder's office of Lucas county, Ohio, in volume 132 of Deeds, page 41, October 3d, 1884; attached, marked Exhibit No. 6.

Certified copy of the last will and testament of Augustus Schell; attached, marked Exhibit No. 7.

162 Also EDWARD ORTON, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. Edward Orton; age, sixty-one. I reside at Columbus, Ohio; am professor in the State University and State geologist of Ohio—professor of geology.

2 Q. In your business have you had occasion to examine the natural-gas fields of Northwestern Ohio with reference to their extent and capacity?

A. Yes, sir; I have been called in my geological work to keep track as far as possible of the developments of new fields.

3 Q. In the examinations that you have made of that field have you made any inquiry or investigation that would give you knowledge of the probable permanency of the gas wells that are produced in that territory?

A. The duration of the gas fields is one of the main factors of in-

terest in the study of those subjects. I have, therefore, given attention to the behavior of the wells with reference to their durability and the time they will last.

4 Q. What has been the result of your investigation in this particular so far as it relates to what is known as the Findlay or the Hancock county fields, in Northwestern Ohio?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. I became acquainted with the Findlay field in the spring after it was discovered—after gas was discovered there. Gas was discovered in large quantities, high-pressure gas, in November, 1884. In the spring of 1885 the second and the third succeeding wells were drilled. I became acquainted with the condition of things in regard to the gas production there at that time, and have followed as closely as possible the development from that time. The Findlay territory proper—the territory of Findlay town—divided itself, after very brief development, into two well-marked regions, a region upon the east side in which the gas rock lay at a higher level, and the region upon the west side connected by a steep slope under ground of the same gas rock with the east at one hundred and fifty feet lower level on the gas terrace. On the east side dry gas was found at first. The wells farthest to the west struck into oil. The wells upon the slope, several of which were struck as far down as one hundred feet below the level of the dry gas in the first well—that is, one hundred feet lower as to tide level—produced dry gas for a short time. The Adams well, for example, gave the most information in regard to the condition of things there. The gas rock was found in it about one hundred feet lower than in the Pioneer well—the No. 1 well. For two months the Adams well produced dry gas—about two months—and at the end of that time it began to spray oil, and, during the fall of 1885, it produced so
163 much oil that the oil had to be separated, it coming up to ten, fifteen, and even twenty barrels of oil a day. The Karg well was drilled in in January, 1886, and the tremendous volume of gas delivered by that well told at once upon the production of the Adams well. The Karg well was found at a level of fifty feet higher in the gas rock than the Adams well. Shortly after the opening of the Karg well the Adams well was so overrun with oil and with water so that it was abandoned, and it has been of no value since. I believe it lost its production of oil very soon, but it was abandoned as a gas well immediately upon the bringing in of the Karg well. Those facts serve as a sort of a clue to the whole history. The wells which were lower upon the slope were overrun by oil and salt water quite promptly. The Adams well was No. 3 or No. 4, as it is sometimes counted. There were two wells brought in about the same time. If we call it No. 4 we will take No. 5, which was the Putnam salt well, which had salt water from the beginning and proved unproductive from the beginning. The Barnes well and the Lima road well, on the east side of town, both found the gas rock at about the same level as the Adams well, and both were overrun by salt water

presently. The Lima road well was abandoned in the course of a year after it had been brought in, and the other well was thrown out of the city lines on account of the amount of salt water it produced. The gas in the Karg well was dry gas, of large volume—twelve million feet a day through a four-inch pipe—when it was first brought in, in the early part of 1886. I have had no opportunity to remeasure the Karg well during that time, but it was clear, from a geological point of view, that it would be the next to be overrun; it was lower down on this slope and would be the next to be overrun by salt water; and a year ago I learned, on the authority of many who were interested, I think some of the gas trustees of Findlay, that the Karg well was throwing salt water; that the salt water had overtaken it, not to the exclusion of the gas, but so as to destroy its reliability. It had been run wide open without any pressure upon the rock to meet the necessities of a growing town, and the salt water had come in very promptly on that account. The Karg well, I have understood from such authority as I have named, has become largely valueless; it cannot be used to make a reliable part of the city supply in a large way; it has to have about as much back pressure upon it as there is in the whole volume of the well. The remaining wells in the territory, which are situated near the Karg well, have followed its fortunes. There is salt water and oil—one or both—in all of the wells that lie below the highest level upon the eastern side of the town. The rock pressure which was in the Findlay field was reported to me at 450 pounds. I never saw it at that figure. The highest figure I have seen was somewhat above 400—was 405 pounds. That rock pressure was maintained for probably two years beyond a comparatively slow abatement, but last year there was a noticeable falling off in the rock pressure, and I un-
164 derstand, from what seems to be good authority, that it was below 200 pounds. The last that I saw during the progress of last year was 220 pounds on a certain gauge, and I was told by a manufacturer using the gas that the rock pressure had fallen to 160 or 170 pounds and at the same time they were obliged to separate the oil and the salt water from the gas. This is a sort of a condensed history of the Findlay township tract.

5 Q. And would the history of the Findlay township tract fairly represent the history of the whole Northwestern Ohio natural-gas field?

(Objected to by defendants as incompetent and irrelevant.)

—. Yes; I have followed the Mercer county field, and that is a very large field, the Mercer and the Auglaize field. That is the only large field to be added to the Findlay field if you count in the Wood county field, which I am disposed to do, as it is a part and parcel of the same large field. I would call the whole of the gas-producing territory of Hancock and Wood counties the Findlay field, because there is no important break, aside from the Bowling Green district, in the whole. It seems to be continuous, but what I have said applies to the central portion of Findlay township.

6 Q. Is this the territory from which the city of Toledo now draws its supply of natural gas?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; it draws its supply from what I have said would be the extension of the Findlay field.

7 Q. You have spoken of salt water. Will you please state what the appearance of salt water in a gas well indicates?

(Objected to by defendants as incompetent and irrelevant.)

A. The appearance of salt water in the gas rock is generally the beginning of the end of gas production. I think it is demonstrable that a column of salt water is the cause of the rock pressure of the gas. The gas is driven by the column of salt water under artesian pressure. I think I am prepared to demonstrate that, at least for the Ohio field, a definite relation between the depth at which the salt water is found with reference to the sea level can be established between the depth at which the salt water is found and the pressure which the gas maintains or is found under in its original discovery in the rock.

8 Q. Then when salt water appears it indicates an absence of gas?

(Objected to on the part of defendants as incompetent and irrelevant.)

A. Yes; it does not indicate complete extinction of the gas, but it indicates that the dry gas, the protected area originally found dry, has been exhausted. Gas will come sometimes for a long period with the salt water in some rocks. Those conditions vary in different regions in that respect.

9 Q. I will now ask you to state what your knowledge and investigation and experience in the Northwestern field has told you as to the duration of gas wells.

(Objected to by defendants as incompetent and irrelevant.)

A. Judging from the Findlay township experience again,
165 I would say that when the wells are run wide open—that is, without a back pressure laid upon them—from the beginning of the field, their duration was somewhat less than three years. There were no large wells that produced dry gas for three years when they were run full. All of the Findlay field, the wells that were opened first, before three years had passed were overrun with salt water, to a greater or less extent.

10 Q. I understand you, then, to every gas well there is a limited supply, which will be exhausted in time on continual draft?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir. As I believe, before a gas field is opened at all there is a certain measure of the porous rock—the highest portion of it—occupied by dry gas. Against that lies either a cushion of oil or a cushion of salt water. If there is a cushion of oil the salt water is always found at a lower depth. We have some fields in which there is

a layer of oil interposed, and others in which the salt water lies directly against the gas, and I think I should be able to adopt your language there, that there is a definite amount for a certain field. I would not say for a well. There is a definite amount because you don't know how far the well will draw, but each arch of the rock has a definite amount. How many wells you put in there would be a question, and you reduce the amount of each well by increasing the number.

11 Q. What I meant by a definite amount was that it was not perpetual or infinite in its capacity.

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir. I take it that gas is a stored product; that it was all in the ground that is able to be drawn. It is true that from the breaking up of the oil, which is highly charged with gas, that would give a sort of a reservoir which wouldn't be dry gas, to begin with, and that would continue the supply if the oil is present to a certain extent.

12 Q. But under continued draft there is no question, is there, but what in time the flow would be exhausted?

(Objected to by defendants as incompetent and irrelevant.)

A. In the case of high-pressure wells I have known of no exception to that statement. I would distinguish between high-pressure and low-pressure gas.

13 Q. Are you able to state whether an enterprise originated for the purpose of piping natural gas from a distance to supply the inhabitants of a city with fuel, not only for domestic purpose, but for manufacturing purposes, would be a speculative, uncertain, and hazardous enterprise?

(Objected to by defendants as incompetent and irrelevant.)

A. The term "speculative" I will hardly take in. I should say that it will be an uncertain line of business and a hazardous line of business to undertake to maintain a supply of gas to such a city for such purposes.

14 Q. What are the elements of uncertainty and hazard in an enterprise of that kind?

(Objected to by defendants as incompetent and irrelevant.)

166 A. It is our want of knowledge of the amount of gas in the reservoir and of the number of wells drawing from the reservoir. It is the uncertainty of the time in which the salt water will overtake the gas. It is the uncertainty as to how much back pressure is required in the field to keep the salt water off from the gas. Those questions are all run into one—as to the amount of gas.

15 Q. Then there is a serious question as to the durability of the supply of gas?

(Objected to by defendants as incompetent and irrelevant.)

A. Certainly; there is great uncertainty as to the supply of natural gas.

16 Q. Are you able to state in a general way what the extent of the Findlay gas field is?

(Objected to by defendants as incompetent and immaterial.)

A. I should rather refer to my maps that I made two years ago before replying definitely in square miles. The boundary that I then drew has, I believe, been confirmed by developments, in a large measure. I can indicate to you the line about as I drew it. It takes in the western side of Bloom township, a number of sections running to the north to rather a narrow strip. It takes in the southern sections of Bloom township. As I drew it, it passed over into Perry township to the eastward. The line came down through Marion township and passed into the township south of Findlay, and then it goes due north to the point of beginning. It would embrace parts of Findlay township, Allen township, Marion township to Cass township. Part of this is in Hancock county. It embraces part of Bloom township, in Wood county, and of Perry, part of Perry township, so far as I recollect the boundaries, and those are the lines I was able to make out. I should rather reduce that amount in the light of recent explorations than to extend it. Some of the boundaries proved fortunately located. They were pretty clear and haven't been moved a half a mile, but in other cases the gas territory has shrunk away, and what was supposed to be gas territory I think couldn't be called so on account of salt water. On the southeastern side especially it has overrun the territory so promptly that it wouldn't be counted valuable, I take it, any longer.

17 Q. Can you approximately state the area of the boundaries you have mentioned?

(Objected to by defendants as incompetent and irrelevant.)

A. I should like to give it by sections. It runs between one hundred and one hundred and twenty-five square miles, as I originally made it; it has been reduced to some extent.

18 Q. It does not, then, exceed 125 square miles according to your estimate?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; it does not exceed that, and I am speaking a little carelessly. The line is upon my map, and the amount to be counted out will reduce that by considerable in area now.

19 Q. You speak of a noticeable falling off in the supply of gas, and I don't know but what you have already accounted for that falling off, but I will ask you again to a little more fully give your ideas of the cause of the failure as suggested by you.

167 (Objected to by defendants as incompetent and irrelevant.)

A. The amount of gas, as I take it, is a definitely fixed amount when a field is opened—definite, within the limits which I have already suggested, as to certain additions which will be got from gas stored in oil. The amount of dry gas is a definite product in the sum stored—held in the field under salt-water pressure.

20 Q. I will ask you whether the draft upon this field which you have described is a large one or not.

(Objected to by defendants as incompetent and irrelevant.)

A. Yes. There are large amounts of gas being had by the towns and the pipe lines that are supplied from this field.

21 Q. Can you form any idea of the probable life of the field under its present draft?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, sir, I think the whole field will go together or large sections that will go together. I think you will find thousands of acres that will fall away at pretty near the same time. I secured last summer some rather surprising facts in regard to the extent to which one well will draw upon the supply and the pressure of adjacent wells, and, to my surprise, I found that a well could lose its gas without any giving out of its own well head; that a well opened a half a mile away would deplete the gas rock of its stores so that all the conditions in the well a half a mile distant from the one opened would be just the same as if it had been open itself.

22 Q. In your judgment, with the present draft upon this territory, is there a supply that will last, say, for ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; I don't believe the supply will last ten years at the rate it is going.

23 Q. Can you say how long you think it will probably last?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, sir, I think, with wise husbandry—with wise care, without waste such as was allowed at first—the gas field should be maintained from five to eight years.

24 Q. But you have no idea that, with even the present draft on the gas field, that it could last ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. I do not believe it could reach ten years.

Cross-examination by Mr. KINNEY:

1 Q. Professor, as I understand you, in your opinion, all the dry gas in this entire field which you have spoken of, in Hancock county and Wood county, is a stored product?

A. Yes, sir.

2 Q. That is, not to be added to at all?

A. Not being added to perceptibly—materially; no, sir.

3 Q. Have you any theories as to how long that has been stored there and of the producing cause of it?

A. Oh, yes. The world is old, we know, and, no doubt, when Adam was a boy if he had begun drilling he would have found gas there.

4 Q. What I want to get at is about how long you suppose
168 it has been there.

A. I think it has been there for many thousands and millions of years. It has been there since the country took its present topography. Every porous rock in the crust of the earth is either stored with water, oil, or gas, and the water is salt or fresh. The salt water, oil, and gas go together through the porous rocks, and wherever you find porous rock that holds these materials that have been combined in the right shape you will find the differentiations of these products, the gas on top and the oil stored below.

5 Q. Under this entire field of gas, I understand you, is the salt water?

A. Yes, or in the porous portions of the rock at a lower level. The porous portions of the rock, you may suppose, leave the rock so that the salt water is not directly below the gas, but it is in the porous portion of the rock at a lower level.

6 Q. And this pressure that drives the gas out is salt water?

A. That is my theory, sir; and I have obtained a number of facts during the last year that seem to me to demonstrate it.

7 Q. That would apply—not to any particular locality, but to this entire field?

A. To this entire field, sir, and to the Indiana field as well.

8 Q. Have you any idea as to how far a gas well in this field will draw gas—how large a territory?

A. I have secured a number of facts upon that point, as it is of great geological interest. I know that the gas will be drawn through a half a mile of rock. A well in the Mercer county field I measured in 1866, when it was first brought in. The yield was three million feet of gas or thereabouts per day. The rock pressure was three hundred and ninety pounds. I went back to that well this summer, after three years. It had never been used any by a pipe line, but under the lease which had been taken of it from the farmer he had the right by his contract to be suplied with fuel gas, and the gas which had been drawn out from it was by a single inch pipe to the farmer's house. I remeasured the well and found that it had shrunk forty per cent. in volume, had lost thirty pounds of pressure, and was overrun by salt water after blowing for twenty minutes, so that when it began to blow the cattle came up all around in a thirsty condition and got the salt water, and they have had it ever since. That was a very surprising and discouraging fact to me in regard to that field. There had been no well within a half a mile of it, but a well a half a mile away had been running wide open for one of the Southern gas lines, and it had despleted the porous rock to that extent. There are other cases in which I have known the pressure to fail three-quarters of a mile away from the open well at the same rate it did in the open well.

9 Q. This gas, I suppose, on your theory, is stored in reservoirs?

A. In the porous rock; yes, sir; which answers as a reservoir.

10 Q. Are there numbers of those reservoirs in this gas territory, or does it all constitute one reservoir?

169 A. No, sir; there are minor troughs of salt water that run through and separate different portions of the field, and there are portions of hard rock that seem to divide it to some extent, so we wouldn't suppose it all one uniform porous sheet of rock. There is no prompt communication between the adjoining fields.

11 Q. So that in any event a well or wells drawing from a given reservoir could not draw from the entire reservoir?

A. No, sir; just how far that extends I have not the facts to determine, but I find the rock pressure of Findlay township running down all the way north. It is, say, less than 200 pounds in Findlay township. A mile north it will be 250 or 280, and you get 380 or 390 in the Stewartsville field.

12 Q. Take that Stewartsville field, is the gas there from the same reservoir as the gas in the Findlay field?

A. It appears to be. I think that is all one reservoir. There is a series of wells that show no interruption right due north. They are tolerably close together. They run down gradually in pressure as you go towards the Stewartsville field. The Stewartsville field has lost something of the rock pressure which it had at the beginning. I judge it has lost, perhaps, fifty or sixty pounds of the original rock pressure. I never saw the rock pressure 450 pounds, but I have had it on good testimony that that figure was marked at first in the Findlay field. I have never seen more than 405—oh, yes, I have. I have seen 460 pounds in the field in a single well in Wood county. That was—I will take that back; but in Findlay township I never saw 450 pounds; I will qualify that.

13 Q. Now, as I understand you, by a reasonable use of this gas in the Findlay field, including the Stewartsvills and the territory around that, you think the supply may last from five to eight years?

A. Yes; I should hope that it would. Of course there is uncertainty in regard to all these questions. It depends upon how much is taken away for different uses. The pipe lines are being extended all the while to new towns, and, of course, the draft will be greater all the time, but, for such a supply as is now required, I should think it ought to be maintained from five to eight years.

14 Q. I suppose it is largely guess-work as to the amount that is stored there, is it not?

A. Well, yes, sir; we know where the level of the salt water is with reference to the sea, and we know where the top gas rock is. Findlay had one hundred feet of dry rock to begin with. There was dry gas 460 feet below the level of the sea, and there was dry gas on the eastern slope at 312 feet below the level of the sea. The salt water has crept along until there is only the extremely eastern portion that is now free from salt water. The wells upon the eastern portion are always light. They are the only ones which have not been invaded, and they are running lower in pressure, the same as the rest, but haven't been invaded by salt water.

15 Q. Those wells that you spoke of invaded by salt water are all in Findlay town.?

A. No, sir; the Marion township wells and the Bloom town-
170 ship wells have been overrun with salt water, and also the Portage township wells. It is not limited to Findlay township, but perhaps my answer applied to that.

Also CHARLES L. STOCK, a witness of lawful age, being by me first duly sworn as hereinafter certified, testified as follows:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. My name is Charles L. Stock; age, 59, and I live at Fostoria.

2 Q. Mr. Stock, you may state in a general way what experience you have had in the natural-gas business.

A. For the last seven years I have done nothing but work in this gas business—that is, the gas business entirely. For twenty years before that I was in the oil business.

3 Q. By the oil business you mean the petroleum-oil business?

A. Yes; sinking wells and managing oil wells.

4 Q. What gas territories are you thoroughly familiar with?

A. I am pretty thoroughly acquainted with the Wood and Hancock gas territory and the territory on what we call the Speechly district, in Pennsylvania

5 Q. Is it the territory tributary to Pittsburgh?

A. No, sir; it is near Oil City, Pennsylvania.

6 Q. Oil City territory?

A. Yes, sir.

7 Q. What experience have you had in the Northwestern Ohio natural-gas field?

A. Well, I have had the management of the wells since they began to drill here.

8 Q. For whom?

A. For the Northwestern Gas Company. I came here three years ago last August.

9 Q. From the experience you have had in this field are you able to speak of the probability of the durability of gas wells sunk in that territory?

A. I wouldn't like to do that.

10 Q. I mean by that as to whether there is a limit as to their durability or not.

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; there is a limit to a strong pressure. That could be answered in two different ways.

11 Q. I wish you would answer that question. What I want to get at is this: I wish to find out whether your experience in this field has taught you whether or not there is a limit to the capacity of any gas well that has been discovered there; and, if so, what is the probable life of the wells or of the territory tributary to the wells.

(Objected to by defendants as incompetent and irrelevant.)

A. Three years ago about this time we had a well——

12 Q. I will ask you first before you begin to make your statement whether you have made measurements as to the rock pressure and supply of these wells.

(Objected to by defendants as incompetent and irrelevant.)

171 A. Yes, sir. Three years ago about the present time we had a well that would show in three minutes 450 pounds. You understand—you open up that well and let her blow all there was in her and close her up—right in—and have a gauge on her, and in three minutes she would show 450 pounds. We have a well drilled since that, and about a year ago—less than a year ago—in that same neighborhood that will show 225 pounds.

13 Q. Do you mean to say that there has been a diminution in the pressure of that amount in that particular territory?

(Objected to by defendants as incompetent and irrelevant.)

A. In that particular territory; yes, sir.

14 Q. Have you found, in all your experience, any well which, under continual draft, don't show symptoms of exhaustion?

(Objected to by defendants as incompetent and irrelevant.)

A. I don't know of any but what does.

15 Q. Would your experience in the gas fields teach you that there is any limit to the supply of any gas well yet discovered?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

16 Q. Have you been able, from your knowledge of the extent of territory and the supply of gas, to say whether an enterprise instituted for the purpose of conveying gas for some distance, say thirty miles, to supply a city of from ninety thousand to one hundred thousand inhabitants with gas for fuel as well as the ordinary manufactories attached to such a city is an uncertain, hazardous, and speculative enterprise or not?

(Objected to by defendants as incompetent and irrelevant.)

A. I think it would be very hazardous to try to conduct a volume of gas thirty or forty miles for any particular length of time. I disagree with the Professor in the probable duration.

17 Q. Professor Orton, who has just testified, do you mean?

(Objected to as incompetent and irrelevant.)

A. Yes, sir. I would say, if those wells are thrown open into a large line, that in from a year and a half to two years from this time they would get little or nothing at that distance.

18 Q. I will ask you what portion of the Findlay field or the Northwestern Ohio field of natural gas would be necessary, in your estimation, to supply a city of from ninety to one hundred thousand inhabitants with natural gas for fuel for domestic use, together with the ordinary manufactures of such a city—what amount or what proportion of the territory now known would be required to furnish such a supply for ten years?

(Objected to by defendants as incompetent and irrelevant.

A. If I was a capitalist and had the franchise of, for instance, this place, and I couldn't get all the gas territory that is in Wood county, I wouldn't try it. I wouldn't think of spending any money to lay a pipe line to supply this town for five years.

19 Q. Hancock county also?

(Objected by defendants as incompetent and irrelevant.)

A. Well, of course, Hancock. If there is no other draft on it but this town it might supply it five years. We had a well
172 on the Speechly farm that we cut in two, it was so strong. I think that was in 1883 or 1884. I am not sure which. In two years from that time you could put an inch pipe into that well, the pressure had gone down so. Now, from my knowledge of the wells in this field by testing they have gone off—the pressure has ceased sixty pounds. To my knowledge they have gone off eighty pounds, and he is correct—that you can take a well even five miles from where they have been taking out gas and the pressure goes down, but not to the same extent as in the wells they are using from, but it goes very much. If you lose eighty pounds in the well you are using, then five miles off you will lose fifty. This is the experience in the wells in this Northern Ohio district. I have the figures for what I say; the actual test; it is not any guess-work at all.

20 Q. Do you know the Karg well?

A. No, sir; only by reputation. I never was at the well.

21 Q. Do you know, from general hearsay, whether it has failed or not?

(Objected to by defendants as incompetent and irrelevant.)

A. Why, I have heard say that—to use the term—it is "played out."

22 Q. Can you give me—not accurately, but approximately—the extent of territory that is recognized as gas territory in the Northwestern Ohio field?

(Objected to by defendants as incompetent and immaterial.)

A. That is, what we recognize?

23 Q. Yes; the Hancock and Wood county fields.

A. You cut Bloom township in two, and the south half of it is pretty fair—nothing extra. You take Allen township, and the wells that have been drilled there seem to be better than they are in Bloom. Cass township has but very few good wells. When you go south of Allen I don't know but little about it.

24 Q. You couldn't estimate in square miles or acreage the probable amount?

(Objected to by defendants as incompetent and irrelevant.)

A. No; I would say that Allen and Cass and part of Bloom is the cream of the territory. Outside of that, unless Findlay has something pretty good down there, and I have never heard that she had,

and I am through there pretty near every day now, the gas well, outside of these places that I speak of are light.

25 Q. I will ask you whether the present draft from this gas field is large or not.

(Objected to by defendants as incompetent and irrelevant.)

A. It is—well, yes; there is quite a draft upon the field at present.

26 Q. Under the present draft, without any increase, what would you estimate the probable life of the territory from which the draft is made?

(Objected to by defendants as incompetent and irrelevant.)

A. This of course would be an opinion?

27 Q. Yes.

A. Nothing more than an opinion?

28 Q. Yes.

A. The city of Toledo wouldn't be able to supply a factory, I don't think, in two years from now, while you might get gas enough in Toledo to supply your domestic wants for the next five years, and of course if Toledo got her domestic supply for five years,
173 why other towns would get the same. You understand the pressure is continually going off. If you take fifty million cubic feet of gas here to-day, and it takes one hundred and fifty million to put it here, in a year from now it would take two hundred and fifty million to put that amount of gas here.

29 Q. I wish you would explain that, whether the production of a well at its mouth can be reproduced after piping it, say, for thirty miles.

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir. We will say that at their well up there now we get 370 pounds pressure—at the mouth of the well. We open that well up and we will probably get a pound or two pounds, according to the pressure. If you have got the end of your line open here taking gas you can't get that amount of gas here that you produce at the mouth of the well, because there is all that length of line and the friction and the waste. It is impossible to make a pipe screwed together that will hold gas if there is any pressure on the line. There will be more or less leaks, and you can't help it. There is wastage all the time.

30 Q. What would be the probable production of a million feet at the well after it reached Toledo?

(Objected to by defendants as incompetent and irrelevant.)

A. It never comes here. You can't get it here.

31 Q. You wouldn't get any?

(Objected to as incompetent and irrelevant by defendants.)

A. You might get just a little, barely a light, but I don't think it would ever reach here. I don't think it would be possible for it to reach here.

32 Q. What amount of pressure would be necessary to get it here and furnish practical results at the end of the line—thirty-three miles long?

(Objected to by defendants as incompetent and irrelevant.)

A. For how much consumption?
33 Q. Fifty million feet per day.
A. You would want two hundred million feet of gas in the field.
34 Q. To produce fifty million feet here?
A. Yes, sir.

Cross-examination by Mr. KINNEY:

1 Q. Do you mean by that that supposing two hundred million feet of gas is thrown into the pipe at the well that only fifty millions of it would reach Toledo?

A. If you shut up the end of your line here and didn't use a bit you may get it here, but when you open the end of your line and consume it, if you want to consume fifty million feet here, it will take that amount of gas to push it here.

2 Q. You turn the gas from the wells into the pipes at the wells?
A. Yes.

3 Q. And then you have got a given amount of pressure on the gas at the pipes where it goes into the pipes. Now, that pressure at that point will continue practically stationary for the period of twenty-four hours, will it not?

A. If you turn it into the line?
4 Q. Yes.
A. If your line is closed up you will get your well pressure on your line. If you close it, no matter where you close it, if your
174 line is tight and there is not too much waste going on along the line, of course you get a well pressure, but when you open the end of your line and begin to consume your pressure goes right down.

5 Q. The pressure where?
A. Your pressure at the end of the line and at the well.

6 Q. There is a certain amount of gas thrown into this pipe at the well?
A. Yes, sir.

7 Q. To be sent to Toledo, we will say. The point I want to get at is, How much of that gas which is put into the pipe at the well will reach Toledo?

A. About one-fifth of it will get here.
8 Q. What becomes of the balance?
A. The balance is still coming. It is behind; it is not lost. It is not wasted if the line is tight, but it takes all that amount to put the fifty million cubic feet here.

9 Q. And the balance will get here in the course of time if you keep up your pressure at the well?
A. Yes, sir.

10 Q. If you draw out from the well one hundred million feet of

gas in twenty-four hours that hundred million feet, or practically that amount, will reach Toledo in the course of time?

A. It will get here, but you can't drive it all through at once. You haven't got the pressure to do it. In every mile you lose, according to your consumption, ten or fifteen pounds; as high as twenty.

11 Q. Lose what?

A. Lose pressure.

12 Q. You don't lose gas, but you lose pressure?

A. Yes; you lose pressure, and in losing pressure of course you lose gas.

13 Q. What becomes of the lost gas?

A. The gas really is not—I don't mean to say that the gas is wasted or thrown away, but the cubic feet does not reach thirty-three miles distant of that one hundred million feet. The hundred million feet won't reach the end of the line when it is open. It will not show one hundred million at the end of the line.

14 Q. If the well is kept open and then followed by more gas coming in that end of the line it will eventually push that hundred million feet here, practically?

A. It will not come here all at one time. There is just as much gas here as you can get at thirty-three miles. It comes through the rock, and if you open your pipe at the end it will not come through the rock as fast as you can consume it. You take a piece of pipe and you throw a piece of clay into it and see if you can get the amount of gas in your stove as you would if the pipe was clear; or you put a piece of cotton in.

15 Q. That would obstruct the course of the gas?

A. Yes; and so does the length of the pipe line.

16 Q. Yes; but while that gas wouldn't be coming as rapidly, still it would come?

A. Yes.

19 Q. If you kept the pressure up out there?

A. Yes, sir.

175 20 Q. If you have a sufficient supply at the field you can supply that gas here?

A. Yes; but the pressure at the field is all the time growing lower.

21 Q. Now, you are getting back to your theory that ultimately this pressure will disappear. I am talking on the assumption that the pressure continues.

A. We have a well that we are using that the pressure goes off seven pounds a month.

22 Q. That is one thing. Now, lay aside your theory that this pressure is decreasing.

A. Yes.

23 Q. And assume, for the purpose of the question, that the pressure continues substantially the same. Now, with the pressure continuing, it will push all the gas put into this pipe and it will be sent to Toledo?

A. Not all of it. There is always a waste.

24 Q. But practically?

A. Yes, sir.

25 Q. Then, after all, the question of how much gas you can get here depends on the supply at the field?

A. Yes, and the amount of gas you have at the field.

26 Q. And you can, by keeping up that supply, practically get to Toledo all the gas you turn into the pipe, allowing for shrinkage and wastage?

A. While you have pressure there; but you must understand that your pressure is all the time going off. Three years ago we had a well that showed 450 pounds after being closed three minutes, and now we have a well in that same neighborhood that shows 225.

27 Q. What has become of the original well?

A. It has gone down just the same.

28 Q. How much is that now?

A. It shows a little better pressure, because it is a better well. It shows 300. There is 150 pounds, you see.

29 Q. Has it been used for three years?

A. Yes, sir. Well, there has been times—for a month, probably, in the hot season—that it has been shut in and not used, but it has been used almost continually.

30 Q. And this still shows a pressure of how much?

A. It will show 300, after being closed, in an hour.

31 Q. What well is that?

A. That is one of our wells that we have.

32 Q. I would like to know what well it is.

A. We have no name for it.

33 Q. Where is it located?

A. In Hancock county.

34 Q. In what township?

A. Washington.

35 Q. What part of Washington township?

A. I can't answer that, for I don't know. I never paid any attention, to know.

Mr. SCOTT:

36 Q. Do you know whose farm it is on?

A. Yes, sir; it is on the Kelley farm.

Mr. KINNEY:

37 Q. Where is the Speechley farm you have spoken of?

A. It is in Venango county, Pennsylvania.

176 37 Q. I understand you to say that a well will draw gas for a distance of five miles, or possibly I am wrong about that. Your statement, as I remember it, was that it would decrease the pressure for five miles?

A. Yes, sir.

38 Q. Is that decrease of pressure occasioned by the drawing of the gas from that territory by this well?

A. Well, what could it be? There wasn't a well in use, that I

knew anything about, inside of four miles or four and a half in a straight line. I was surprised at that.

39 Q. In any direction?

A. In either direction. There is not a well in either direction, and there is very few wells in there, anyway; very few.

40 Q. And this well—where is that well?

A. In Hancock county, in Cass township.

41 Q. On what farm?

A. I don't know what farm it is.

42 Q. Is there any particular name for the well?

A. No, sir; our wells are numbered, and I couldn't tell you from memory what the number of it is.

43 Q. And that well was opened when?

A. We never have used anything from that well; we never have had a pipe line to it.

44 Q. And the other well that is draining this territory, as you suppose, is located where?

A. Oh, other wells that are going into the lines supplying Findlay, the wells that they are drawing on now or supplying Findlay nearest to this well; they are all supplying Findlay.

45 Q. You say you have a well that from actual demonstration, as you understand it, has decreased the pressure of the gas five miles distance from that well?

A. From any well that is being used, from four to five miles; it might be possibly not over four miles to the nearest well that they are using.

46 Q. Well, you have got a well located in the northeast corner, we will say, forillustration, of Cass township?

A. Yes.

47 Q. Now, you say that decreases the pressure from another well located five miles distant from it to the south?

A. Yes, sir.

48 Q. Now, this first well is standing by itself, is it?

A. You don't understand me exactly. The draft five miles away from that well by wells that are in use has drawn the pressure off of this well four or five miles from where they are using in the field.

49 Q. When was this well opened that the pressure is being decreased in?

A. About a year and a half ago, I think.

50 Q. Where is that well located?

A. In Cass township; I couldn't give you the exact location.

51 Q. Have you ever used that well at all?

A. No, sir; we never had a pipe line to it; that is what surprised me.

52 Q. That was opened and tested about a year ago?

A. No; we tested it here about two months ago.

53 Q. The first time it was tested?

A. That was when the well was new; about a year and a half ago.

177 54 Q. And then it was tested again when?

A. About two months ago; six weeks ago or two months ago we put the gauge on it.

55 Q. It hadn't been tested from the time it was opened to this time?

A. No, sir; it had been closed up all the time. The only draft there was on that well was to supply a farm-house through a three-quarter-inch pipe line.

56 Q. Is that the same well that Prof. Orton spoke of?

A. No, sir; that well he spoke of was down in Mercer.

57 Q. When you first opened that well what pressure did it show?

A. I didn't get a gauge on her when she was new, but about the time it was opened the wells anywhere over the field would show 450 pounds, and a year ago now our wells showed 410.

58 Q. What did this well show?

A. I can't tell you.

59 Q. What did it show when you measured it last?

A. It showed 385 pounds.

60 Q. How do you know that that well showed any more than 385 when it was opened?

A. Because I tested all of the wells outside of the gas district as well as this one and got their pressure when they were new, and that showed 450 pounds.

61 Q. Do you mean to say that all wells show the same amount of pressure?

A. Well, they will all show the same amount of pressure if they don't show more than 500,000 feet in 24 hours. I have an idea that all the gas wells in this district that are drilled, if they don't get more than a hundred thousand feet of gas, I think they will run up to 450; they will show the same rock pressure.

62 Q. Without regard to the amount of gas furnished—that is, above a certain amount?

A. Yes, sir; the same amount of rock pressure; but a large well will show the rock pressure probably in three minutes, and maybe in less.

62½ Q. If a well will show the same pressure without regard to the amount of gas furnished by those wells, why is it that a decrease in the pressure indicates a loss of gas?

A. Well, the gas is not there to give the pressure; in fact, you can get a high pressure and still not have much gas.

63 Q. That being so—that the wells will show the same amount of pressure without regard to the amount of gas furnished—how is it that a decrease in pressure indicates a decrease in the quantity of gas in the field?

A. Because the gas is taken out and the pressure taken off. If you can't get the pressure you haven't got the gas.

64 Q. Say you get 450 pounds *feet* of pressure in furnishing one hundred thousand feet of gas?

A. Yes.

65 Q. And you get the same amount of pressure in furnishing ten or twelve million feet of gas?

A. Yes.

66 Q. If the same amount of pressure is present when you furnish one hundred thousand feet that is present when you furnish twelve millions — of gas, how is it that the decrease of pressure indicates or shows a decrease in the amount of gas?

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A. The rock is being exhausted.

67 Q. How do you know that?

A. Because the wells won't throw up the same amount of pressure—that is, measure the same amount of feet—at the mouth of the well.

68 Q. That is not shown by the pressure being decreased?

A. Yes; I think it is.

69 Q. Your idea is that this whole gas territory—and I mean by that the gas territory of Hancock and Wood counties—with the draft continuing as it is now, will be so exhausted inside of two years that it will be impossible to get gas to Toledo for manufacturing purposes?

A. Yes, sir.

70 Q. How long would it be possible, in your opinion, to get gas in Toledo for the same amount of consumption continued for domestic use?

A. Well, if we could get gas here for two years and supply manufacturers in all probability, with the same sized line, we may possibly be able to supply the private consumption here for as long again as that time; but, now, that is only an opinion. You must remember that a cold day makes a great difference in the gas pressure.

71 Q. You say that the same sized pipes—isn't it possible to, as the pressure decreases at the wells—isn't it possible by increasing the size of the pipe to keep up the supply?

A. There wouldn't be the amount of friction in a large pipe that there is in a smaller one.

72 Q. ——?

—. No, sir; I don't think so. I think in order to use the gas you have got to go where it is and not carry it away so many miles.

73 Q. You speak of low pressure and high pressure—using the wells at low pressure and high pressure. You make a difference between those as to the time it would take to exhaust a well, do you not—that is to say, the well will last longer under a low pressure than it will under a high pressure?

A. No. I don't understand your question in regard to that. Oh, do you mean for the consumption?

74 Q. Yes.

A. Oh, well, certainly; you don't use near so much gas.

75 Q. Under a low pressure is it not possible to keep this gas running through the pipe as great a distance as thirty miles?

A. I don't think it is; not many years. That is an opinion of my own, now. I don't have an idea that gas could be sent forty miles to supply a great, large city and a lot of manufactures for four years from now.

76 Q. That is, to take the whole territory, you don't think it would be a good investment?

A. That is my opinion. I don't see where the money is ever going to come back that is being expended.

77 Q. You know, I suppose, as a matter of fact that they are preparing for or actually extending their lines to supply Detroit with this natural gas?

A. Yes; I have heard so. I have no knowledge of it from my own knowledge, but I have heard such talk.

179 Re-examination:

1 Q. Say a well is capable of producing one hundred million feet; that amount of gas wouldn't necessarily go through?

A. That is right.

2 Q. State whether or not every mile of pipe added to it does not decrease the amount of gas got through.

A. Yes, sir.

3 Q. Is it not retarded in the well instead of going through?

A. Yes; it does not come from the well, the friction is so great?

Mr. KINNEY:

1 Q. That is to say, the friction operates as a pressure backwards?

A. Yes, sir.

2 Q. And the gas, therefore, can't escape as fast as it can when there is no back pressure?

A. Yes, sir.

Also JOHN TOMKIN, a witness of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. SCOTT:

1 Q. You may state your name, age, residence, and occupation.

A. My name is John Tomkin; age, 52; residence, Fostoria, Ohio, and I am assistant manager of the Northwestern Ohio Natural Gas Company.

2 Q. What knowledge have you of the Northwestern Ohio natural-gas field—I refer to the gas fields of Wood and Hancock counties?

A. I have been about two years and a half in that field. My knowledge is about as general, I suppose, as a man could learn in the business that I have been in.

3 Q. Can you give any idea of the extent of the now known gas territory in the Northwestern Ohio field?

(Objected to by defendants as incompetent and irrelevant.)

A. I have been trying to get at it. As near as I can estimate it I don't think it is quite one hundred miles. I don't think it is as much as the Professor places it.

4 Q. You don't think it extends one hundred square miles?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; I don't think it is that. There is a certain amount of territory somewhat undeveloped yet over on the eastern border, but it is small. There may be more of that than we think there is, but we have the western boundary defined.

5 Q. Are you able to state the durability of the gas field?

(Objected to by defendants as incompetent and irrelevant.)

A. It would depend entirely upon the situation and location of the surroundings. There are some wells close together, and they show within the last two years—I think in a year—a very marked decline. Others further away and more isolated haven't shown the same amount of decline.

6 Q. Is it a rule that there is a decline in all wells under a continual draft?

(Objected to by defendants as incompetent and irrelevant.)

180 A. Yes, sir.

7 Q. Do you know of any exception to this general rule?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; I never heard of any and never saw one. I would say that we have some wells that have very short lives, just on account of the manner in which we have taken the gas out, and others where we have not made a heavy draft on them, which, of course, don't show the same decline.

8 Q. I will ask you whether your knowledge as obtained from your past experience has told you whether an enterprise originated for the purpose of conducting gas by a pipe line at, say, some thirty miles from the field to supply a large city of from ninety thousand to one hundred thousand inhabitants with gas for fuel is a hazardous enterprise or not.

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; I consider it hazardous under any conditions, and under some conditions much more so; that would depend very much upon the amount of territory that the party controlled.

9 Q. What are the elements of hazard in an enterprise of this kind?

(Objected to by the defendants as incompetent and irrelevant.)

A. We have in this field more than ordinary. The close proximity to the oil territory makes it more hazardous than many anticipated when they first went into business there. We find that on the western and the north border, and on the south border also, where salt water is not coming in, the oil development there has very materially lessened the value of the gas territory. That is one source of hazard; being so close to the oil territory it must necessarily threaten the gas territory. There is a certain amount of gas escapes with every oil well. I believe that with the gas wells producing a single foot of gas, if the oil wells lasted a sufficient number of years, this gas would be exhausted.

10 Q. That there would be an exhaustion of the gas by the exhaustion of the oil?

(Objected by defendants as incompetent and irrelevant.)

A. Yes; and by the salt water coming in to take its place.

11 Q. You speak of salt water. What does the presence of salt water in a gas well indicate?

(Objected to by defendants as incompetent and irrelevant.)

A. Our term is that it is a "dead well" when the salt water comes in.

12 Q. It indicates that for gas purposes the well is a failure?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir; in other words, we term it "played out."

13 Q. Is the draft upon this field at the present time—would you consider it a large one?

(Objected to by defendants as incompetent and irrelevant.)

A. Not very large I don't consider it; not an unusual draft for the amount of territory.

14 Q. With the present draft upon the field now known what would be the probable duration of the supply?

181 (Objected to by defendants as incompetent and irrelevant.)

A. Well, that is very hard to estimate. I have assumed heretofore upon discussing this question that it is possible, with this amount of territory known to exist and the amount of consumption that we have to-day, that there ought to be a life of from five to eight years; that has been my estimate heretofore. I have never done very much figuring on that question.

15 Q. Do you think that there is a reasonable probability that it will exist more than ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. No, sir; I don't think it is possible to exist that long, with the experience that we have had for the past two years.

16 Q. Go on and state why.

(Objected to by defendants as incompetent and irrelevant.)

A. My answer depends on this—that is, to carry any distance. There will be some wells that will produce gas to use in that vicinity. I have no doubt but what there will be.

17 Q. I mean at a distance—to carry in a trunk line thirty miles.

(Objected to as incompetent and irrelevant by defendants.)

A. No, sir; I don't think there will be; I don't expect it.

18 Q. What amount of territory do you think would be necessary to furnish a reasonable supply to a city thirty miles distant from the field—fifty millions of cubic feet per day for, say, ten years?

(Objected to by defendants as incompetent and irrelevant.)

A. Well, I should want not less than thirty to forty thousand acres if I wanted to make any money out of the investment.

19 Q. Would ten thousand acres be a reasonable supply?

(Objected to by defendants as incompetent and irrelevant.)

A. Not for a city of that kind if others were drawing around it.

Cross-examination by Mr. KINNEY:

1 Q. With some of these wells that are there—that have come in—with a large amount of gas, there is at the same time almost, on the opening of the well—salt water has appeared, has it not?

A. Salt water appeared at the opening.

2 Q. Well, very soon, in some cases?

A. Well, sometimes.

3 Q. Where at the same time the well is furnishing a large amount of gas?

A. No; that is an exception. I say sometimes we have had salt water.

4 Q. That occurs?

A. Yes; sometimes, but not often.

5 Q. And it has happened that for some time the well will continue to furnish a large amount of gas mixed with salt water?

A. No, sir.

6 Q. Has that never occurred?

A. It is a very rare case if you have salt water to start in on. I think as a rule the salt water invariably increases.

7 Q. The point is whether as a matter of fact there are no cases where the gas and the salt water both continue to be discharged from the well in considerable quantity for a long period of time.

A. We couldn't use the well under those conditions.

8 Q. I am not asking whether you can use it or not.

182 A. When a well develops that system it becomes perfectly worthless, and it is always shut in or abandoned. We cannot utilize it. I don't remember of any case. We have some wells that have shown that symptom, one or two, but I know of no case where there was salt water coming in with the gas, no matter how small the quantity, but in a very short time the well was useless.

9 Q. The question is as to whether that does take place.

A. No, sir; it constantly decreases if it does flow. I mean that it decreases in the ratio of the increase of salt water. I don't mean that it would decrease just as a dry well would; it decreases largely in excess of that; that is my theory and my practice, too.

10 Q. The larger the quantity of salt water the smaller will become the quantity of gas?

A. Yes, sir; it decreases.

11 Q. On the other hand, there might be, and are, cases where the salt water has been comparatively small in quantity and a very considerable amount of gas?

A. Yes; we sometimes find that the case when we first strike it; it is not very often that you strike a good well where you strike very much salt water.

12 Q. Do you know anything about a well struck recently at Upper Sandusky, or near there?

A. Yes, sir.

13 Q. That was reported to be a very large well?

A. Yes; I was at the well.

14 Q. That has been throwing salt water, has it not?

A. Yes; it was so reported to me.

15 Q. And the flow of gas continued?

A. Well, I understand the well is not flowing now. They have shut it off; it flowed salt water for quite a number of days. 16 *Q.* I don't know. The man I had there was not there very long. He reported the well flowing a large amount of salt water, but he went back again in a few days and the well was shut in.

Plaintiffs at this point offered in evidence the issues of the Toledo Daily Blade from March 20th, 1889, to March 31st, 1889, inclusive; also—

The Toledo Commercial from March 20th, 1889, to March 31st, 1889, inclusive.

The Sunday Journal of the dates March 24 and March 31, 1889.

The Bee from March 20th, 1889, to March 31st, 1889, inclusive.

Defendants, by their counsel, objected to the admission of each and all of said papers.

It is stipulated that the actual attachment of the newspaper exhibits, on account of their bulk, being inconvenient, is waived; that either party may on the trial of the case *may* read from said papers so much thereof as shall be relevant to the issue in this controversy, and both parties reserve the right to except to the same on account of irrelevancy or incompetency.

183 Plaintiffs recalled for further examination CHARLES A. VORTRIEDE, who, having been heretofore sworn herein, further deposes and says:

Direct examination by Mr. POTTER:

1 Q. I will ask you if, since your examination before, you have made an examination of the matters that I asked you to investigate and give further testimony upon.

A. Yes, sir.

2 Q. Will you state the result of such investigation and examination?

(Objected to by defendants as incompetent and irrelevant.)

A. The first thing to be ascertained was the ratio or proportion that the unimproved property bore to the improved, as to value on the duplicate. The figures that we have prepared show that the improved property is 74%—that is, the value of the improved property is 74 % of the duplicate. The second item was as to the number of lots on the duplicate that were improved compared to those unimproved. The result of those figures is that 40% of the lots on the duplicate are improved.

3 Q. Can you give the valuations on the improved and on the unimproved?

(Objected to by defendants as incompetent and irrelevant.)

A. Yes, sir.

The valuation of the improved property is	$17,271,520
Of the unimproved	5,879,100
On a total city duplicate valuation of	$23,150,620

Cross-examination by Mr. KINNEY:

1 Q. And the total valuation of personal property is how much?

A. It is nine millions and something. I think I gave that before.

2 Q. About how does the duplicate valuation of the personal property compare with the real value, if you are able to state?

A. I could hardly make a guess at that. Of course the personal property—there is a good deal of it that don't get onto the duplicate, and that we don't know anything about. The personal property is on the duplicate at a much lower ratio than the real estate.

3 Q. And the real estate is on the duplicate at about forty per cent.?

A. I should consider it about forty per cent. at the present time. Ten years ago it was supposed to be about sixty per cent.

4 Q. Have you any means of telling what proportion of those improvements have been made within the last five years, say?

A. As to the number?

5 Q. Yes; the number and the value both.

A. I can find the statistics and give it from them. We have to furnish it every year. I find, on examination, it gives it for the whole county. I furnished it and could furnish it, but I would have to go through the assessor's books for the different years and figure it up.

6 Q. Can you tell us what the duplicate valuation of the property in the city was in 1885 and for each subsequent year?

A. Yes, sir.

184

In 1886 it was,	real estate	$22,179,770
	personal property	8,118,620
	Total	$30,298,390
In 1887 it was,	real estate	$22,559,910
	personal property	8,242,390
	Total	$30,802,300
In 1888 it was,	real estate	$23,150,620
	personal property	9,467,100
		$32,617,720

1889 we have not got yet. It will be about a half million over 1888. The principal reason for the decrease in the amount of the personal property is that the insurance companies, who have to make a return of their gross receipts this year, are only required to make returns from the first of May to the 31st of December, on account of a change in the law.

Mr. POTTER:

1 Q. Will you state the duplicate valuation of the Augustus Schell property, so called, at Air Line Junction?

A. There are sixty-seven acres in section three, town. three, assessed at $27,030.

2 Q. Also state the duplicate valuation of lot nine and the west twenty-three and one-half feet (23½) of lot No. ten, Port Lawrence.

A. It is assessed $29,830.

3 Q. Also give the duplicate valuation of lot 57, Port Lawrence.

A. $5,998.

4 Q. Also the duplicate valuation of the property described in the exhibit filed with the notary, described in a deed from Thomas C. St. John and wife to Wallace C. Andrews, being the south half of the south half of the northwest quarter of section No. 26, town. 9.

A. The duplicate description is the south 59.22 acres, excepting .34 of an acre in the southeast part of the northwest quarter of section 26, range seven, town. nine, 58.88 acres, $25,240 value.

I find here the north 9.35 of the east half of the southwest quarter, except 2.30 acres in the southeast part of the southwest quarter of section 26, 7.5 acres, $3,150 valuation.

Also two other small pieces in the southwest quarter, the north .26 of the east 19.9 acres of the west 28.67 acres of the southwest quarter, $90 valuation.

Then the north 1.4 acres of the west 9.58 acres, $380. Those are the only pieces I find in section 26.

Also 2.96 acres in that part east of Detroit avenue of the southeast quarter of section 27; valuation, $930.

I also find the duplicate valuation of lots numbers 63 to 81, inclusive, 84 to 86, inclusive, 107 to 122, inclusive, in Robinwood Extension; the aggregate is $4,000.

185 5 Q. Can you give the duplicate valuation of the railroad property within the city for those years?

A. Yes, sir.

6 Q. Please give it.

(Objected to by the defendants as incompetent and irrelevant.)

A. $1,495,470.

(Counsel for complainants here announced that the taking of testimony herein was concluded upon their case in chief.)

THE STATE OF OHIO, } ss:
Lucas County, }

I, Edward H. Smith, a notary public in and for the county and

State aforesaid, duly commissioned and qualified, do hereby certify that the above named (George H. Bodette, William T. Walker, George H. Cole, Thomas R. Wickenden, George H. Beckwith, Charles A. Vordtriede, E. W. Tolerton, Joseph W. Cummings, Francis J. King, True W. Childs, C. W. Manahan, George W. Davis, William J. Colburn, William A. Gosline, Robert Cummings, William F. Crane, Hamilton S. Corwin, William D. Hartupee, Edwin Squire, L. F. Barger, Edward Orton, Charles L. Stock, and John Tomkin) were by me severally sworn to testify the truth, the whole truth, and nothing but the truth; that the signatures of the respective witnesses to their depositions were waived by consent of counsel; that the said depositions were by me taken in short-hand in the presence of said witnesses and afterwards reduced to typewriting, in accordance with stipulation of counsel, appearing at the taking thereof; that said depositions were taken at the time and place in said notice specified and continued from day to day as therein noted.

I do further certify that I am not counsel, attorney, or relative of either party or otherwise interested in the event of this suit.

In witness whereof I have hereunto set my hand and seal of office this 25th day of October, A. D. 1889.

EDWARD H. SMITH,
Notary Public, Lucas County, Ohio.

186 EXHIBIT A, DEP'N GEO. H. COLE. E. H. S., Notary.

Board of aldermen, regular meeting.

MONDAY, *Aug.* 16, 1886—7.30 p. m.

Present: Messrs. Cooke, Degnan, Locke, Lorenz, Schultz, Seek, Waring, and Cooney—8.

Mr. Cooney, the president, in the chair.

Petitions, ordinances, and resolutions.

Mr. Locke presented an ordinance granting to the Nerthwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo, and to repeal an ordinance granting Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in city of Toledo; which was read the first time, rules suspended—ayes, 8—and read the second time.

Mr. Lorenz moved to amend section 8.

Lost.

Mr. Locke moved to amend section 8 to make time for supply of gas October 1, 1887.

Carried.

On motion for suspension of rules for third reading.

Lost—ayes, 5; nays, Messrs. Degnan, Lorenz, and Cooney—3.

Board of councilmen, regular meeting.

MONDAY, *Aug.* 23, 1886—7.30 p. m.

Present: Messrs. Birkenhauer, Cole, Cooke, Gould, Hackett, Hanner, Ketcham, Peiter, Raitz, Spain, Speilbusch, and King—12.

Absent: Messrs. Hoffman, Merrill, Van Aarle, and Wade—4.

Messrs. Hoffman and Van Aarle came in and took their seat.

Business from board of aldermen.

An ordinance granting to the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo, and to repeal an ordinance granting to the Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in city of Toledo; which was read the first time, rules suspended—ayes, 14—and read second time.

Mr. Ketcham moved Mr. Doyle be heard.

Carried.

Mr. Doyle addressed the board, and was followed by Mr. Charles Foster and Mr. C. A. King.

Mr. Cooke moved to amend by striking out amendment made by aldermen board to section 8, as follows:

"The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon."

Carried—ayes, 11; nays, Gould, Hackett, and Hoffman—3.

Rules suspended—ayes, 13; nays, Mr. Hackett—1.

Ordinance as amended read the third time and passed—ayes, 13; nays, Mr. Hackett—1.

187 Board of aldermen, regular meeting.

MONDAY, *Aug.* 30, 1886—7.30 p. m.

Present: Messrs. Cooke, Degnan, Locke, Lorenz, Schultz, Seek, Waring, and Cooney—8.

Business from board of councilmen.

An ordinance granting the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo, and to repeal an ordinance granting Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in the city of Toledo.

For concurrence in amendment by board of councilmen, striking from ordinance the following amendment to the ordinance made by board of aldermen:

"The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon."

Mr. Lorenz moved to amend ordinance on leave.

Mr. Doyle heard for Ohio Natural Gas Company.

Amendment lost—ayes 4; nays, Messrs. Cooke, Locke, Schultz, and Seek—4.

Mr. Lorenz moved to amend by the first clause of his amendment.

Lost—ayes, Messrs. Degnan, Lorenz, Waring, and Cooney; nays, 4.

On question of concurrence in amendment with board of councilmen, lost—ayes, Messrs. Cook, Locke, Schultz, and Seek—4; nays, 4.

Board of councilmen, regular meeting.

MONDAY, *Sept.* 6, 1886—6.30 p. m.

Present: Messrs. Burkenhauer, Cole, Cooke, Gould, Hackett, Hoffman, Merrell, Peiter, Speilbush, Wade, and King—11.

Absent: Messrs. Hanner, Ketcham, Raitz, Spain, and Van-Aarle—5.

Messrs. Ketcham, Spain, Raitz, Van Aarle, and Hanner came in and took their seats.

Business from board of aldermen.

Ordinances.—To grant to the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo, and to repeal an ordinance granting Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in city of Toledo.

For concurrence in amendment made by aldermen board,
188 struck out by board of councilmen and not concurred in by aldermen board.

It was moved to recede as to amendment and adopt amendment of the board of aldermen:

"The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon."

Carried, and ordinance, as amended, passed—ayes, 16.

An ordinance granting to the Northwestern Ohio Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo for heating and power purposes, and repealing an ordinance entitled "An ordinance granting to the Citizens' Natural Gas Company the right and privilege to maintain and operate gas pipes in the city of Toledo for heating and power purposes."

SECTION 1. Be it ordained by the common council of the city of Toledo, That, subject to the terms, conditions, and provisions of this ordinance, there is hereby granted to the Northwestern Ohio Natural Gas Company, its successors and assigns, the right of way along, through, and under the streets, avenues, lanes, alleys, and public places in said city for the purpose of laying, constructing, maintaining, and using and operating one or more lines of gas mains and branch pipes, with necessary feeders and service pipes, drips, and other devices necessary for the successful operation of said

lines and pipes in the conducting, supplying, and delivering natural or produced gas to consumers thereof for heating and power purposes.

SECTION 2. Whenever such company or corporation shall desire to lay down, relay, or extend their gas pipes through any of the streets, alleys, avenues, or public places of said city application for that purpose shall be made to the city civil engineer of said city and permission therefor obtained in writing before making any excavation or doing any other work in that connection; and all excavations made and all work done under the power and authority conferred by this ordinance on the streets, alleys, avenues, and public places of said city shall be under the direction of the city civil engineer and to the approval of said engineer and the common council of said city: Provided, however, that said company or corporation shall not make any excavation nor tear up the pavements for the purpose of laying any pipes in Summit street from Perry street to Elm street without permission being first granted therefor by resolution of the common council; but the said corporation may, under the direction of the city civil engineer, cross Summit
189 street between the points aforesaid with their said pipes by tunnelling under said street in such manner as to not injure or affect the pavement of said street.

SECTION 3. Such company or corporation shall not open or encumber more of any street, avenue, alley, lane, or public place at any one time than may be necessary to enable it to proceed with advantage in laying such main feeder, connection, or service pipe, nor more than shall have been previously authorized by the permit in writing, obtained from the city civil engineer, nor shall said company or corporation permit any such street, alley, avenue, lane, or public place to remain open or encumbered for a longer period than may be reasonably necessary to execute the work for which the same shall have been opened, nor without putting up and maintaining the necessary barriers and lights so as to effectually prevent occurrence of any accident in consequence of such opening or encumbering of such street, alley, evenue, or public place.

SECTION 4. Whenever such company shall open ground in any street, alley, avenue, or public place they shall forthwith, after laying such mains, pipes, &c., in the same, restore the pavement, sidewalk, and ground to a condition equally good as before and at their own expense; and said company shall, also at their own expense, put and keep any portion of the street, pavement, planking, or macadamizing removed by them for such purpose in as good condition as the same was before such work or removal, and shall keep the same in as good condition for one year thereafter. If said company or corporation shall fail to do any of the work required by this section the same may be done by said city, and said company or corporation shall be liable for the costs thereof.

SECTION 5. Such company or corporation shall do no permanent injury to any street, sidewalk, alley, avenue, or public place or in any manner unnecessarily disturb or interfere with any water or

gas pipes or any sewer now laid by said city or any other authorized person, company, or corporation; also said The Northwestern Ohio Natural Gas Company shall save the said city of Toledo harmless from any and all damages or injury which it may at any time incur by reason of any excavation that shall be made under this ordinance or by reason of conducting said natural gas through the streets, alleys, lanes, and public places in said city by said company or corporation or its use by said company.

SECTION 6. Whenever the common council of the city of Toledo shall determine to pave or otherwise improve any of the
190 streets, alleys, lanes, or public places of said city, said company or corporation shall, if required so to do by ordinance of the common council, lay down their mains and service pipes in and along the property so to be improved at such time as the common council may direct.

SECTION 7. The Northwestern Ohio Natural Gas Company, its successors or assigns, shall make connections with the mains or branch lines and lay service pipes for furnishing natural gas to consumers adjacent to said lines who may desire to use the same, provided that in the opinion of the said common council the amount of gas consumed by such parties will justify the laying of said pipes and making such connections; said service pipes to be laid by said company to the curb line on all streets or avenues without expense to said parties desiring to use the same.

SECTION 8. Should said The Northwestern Ohio Natural Gas Co., its successors or assigns, neglect or fail to prosecute with all reasonable diligence the work of bringing natural gas to Toledo for the foregoing purposes and fail to furnish a reasonable supply of the same by October 1st, 1887, the franchise and privileges herein granted may be by a resolution, duly passed by said common council, declared forfeited and all rights hereby acquired shall then determine and cease. The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms and conditions as said common council and said company or corporation may hereafter determine upon. This ordinance and all rights herein granted shall be subject to any general ordinance or ordinances which may hereafter be adopted by the common council regulating the mode and manner of laying, relaying, and repairing the mains or pipes, conductors, connections, and drips, and the conducting of gas through the streets, lanes, alleys, squares, docks, and lands of said city not inconsistent with the provisions of this ordinance.

SECTION 9. That an ordinance entitled "An ordinance granting the Citizens' Natural Gas Company the right to lay and maintain gas pipes in the streets, alleys, and public places in the city of Toledo for heating and power purposes, passed November 16th, 1885, be, and the same is hereby, repealed.

Passed Sept. 6th, 1886.

Attest: H. D. STANDART, *City Clerk.*

Approved Sept. 7, 1886. S. F. FORBES, *Mayor.*

22—1215

191 Board of aldermen, regular meeting.

MONDAY, *Sept.* 13, 1886—7.30 p. m.

Present: Messrs. Cooke, Degnan, Schultz, Seek, Waring, and Cooney—6.

Absent: Messrs. Locke and Lorenz—2.

Report of officers.

His honor the mayor reported an agreement and bond of the Northwestern Ohio Natural Gas Company for $10,000, and resolutions:

Resolved by the common council of the city of Toledo, That an agreement dated September 7, 1886, and signed by the Northwestern Ohio Natural Gas Company, by Charles Foster, president, and also a bond of $10,000, of same date, signed by the Northwestern Ohio Natural Gas Company, by Charles Foster, president; Charles Foster, and B. F. Nichols, be, and the same hereby are, approved and accepted.

Adopted—ayes, 6.

Board of councilmen, regular meeting.

MONDAY, *Sept.* 30, 1886—7.30 p. m.

Present: Messrs. Birkenhauer, Cole, Cooke, Gould, Ketcham, Peiter, Raitz, Spain, Speilbusch, Van Aarle, Wade, and King—12.

Absent: Messrs. Hackett, Hanner, Hoffman, and Merrell.

Mr. Hoffman came in and took his seat.

Business from board of aldermen.

Resolved by the common council of the city of Toledo, That an aareement dated September 7, 1886, and signed by the Northwestern Ohio Natural Gas Company, by Charles Foster, president, and also a bond for $10,000, of same date, signed by the Northwestern Ohio Natural Gas Company, by Charles Foster, president; Charles Foster, and B. F. Nichols, be, and the same hereby are, approved and accepted.

Adopted—ayes, 12.

I hereby certify that the foregoing ordinance and minutes are true and correct copies of originals on file in the office of the city clerk of the city of Toledo.

G. H. COLE, *City Clerk.*

192 EXHIBIT B TO DEP'N OF GEO. H. COLE. E. H. S., Notary.

Board of aldermen, regular meeting.

MONDAY, *Aug.* 30, 1886—7.30 p. m.

Present: Messrs. Cooke, Degnan, Locke, Lorenz, Schultz, Seek, Waring, and Cooney—8.

Business from board of councilmen.

Mr. Cooney, on leave, presented an ordinance granting the Toledo Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo for heating and power purposes; which was read first time, rules suspended—ayes, 7; nays, Mr. Lorenz—1.

Read second time.

Mr. Lorenz moved to amend as follows:

SECTION 9. Within 30 days after the passage of this ordinance the said company shall execute and deliver to the city of Toledo an agreement, in such form as shall be approved by the city solicitor, expressing the assent of said company to and undertaking to perform the terms and requirements of this ordinance on its part and to furnish gas to all persons requiring it in the city of Toledo (so far as said company may be able), without preference or favoritism, on equal terms and at reasonable prices, reference being had to the cost of producing and delivering the same and the prices for like supplies in other cities.

Carried, rules suspended—ayes, 7; nay, Mr. Locke—1.

Read third time and passed—ayes, 7; nays, Mr. Locke—1.

Board of councilmen, regular meeting.

MONDAY, *Sept.* 6, 1886—7.30 p. m.

Present: Messrs. Birkenhauer, Cole, Cooke, Gould, Hackett, Hoffman, Merrell, Peiter, Speilbusch, Wade, and King—11.

Absent: Messrs. Hanner, Ketcham, Raitz, Spain, and Van Aarle—5.

Messrs. Ketcham, Spain, Raitz, Van Aarle, and Hanner came in and took their seats.

Business from board of aldermen.

Ordinances.—To grant to the Toledo Natural Gas Company the right and privilege to lay, maintain, and operate gas pipes in the city of Toledo for heating and power purposes.

Mr. Cooke moved to suspend rule No. 16.

Carried—ayes, 13; nays, Messrs. Cole, Gould, and Spain—3.

Ordinance was read first time, rules suspended—ayes, 16; read second time, rules suspended—ayes, 16; read third time, and passed—ayes, 16.

193 Board of aldermen, regular meeting.

MONDAY, *Sept.* 27, 1886—7.30 p. m.

Present: Messrs. Cooke, Degnan, Locke, Schultz, Waring, and Cooney—6.

Absent: Mr. Seek—1.

Report of officers.

The city clerk reported communication from his honor the

shall, if required so to do, by order of the common council, lay down their mains and service pipes in and along the property so to be improved at such time as the common council may direct.

SECTION 7. The Toledo Natural Gas Company, its successors or assignees, shall make connections with the mains or branch lines and lay service for furnishing natural gas to consumers adjacent to said lines who may desire to use the same: Provided that, in the opinion of said common council, the amount consumed by such parties will justify the laying of said pipes and making such connections, said service pipes to be laid by said company to the curb line on all streets or avenues without expense to said parties desiring to use same.

SECTION 8. Should the said Toledo Natural Gas Company, its successors or assignees, neglect or fail to prosecute with all reasonable diligence the work of bringing natural gas to Toledo for the foregoing purposes and fail to furnish a reasonable supply of the same by October 1st, 1887, the franchises and privileges herein granted may be by a resolution, duly passed by said common council, declared forfeited and all rights hereby acquired shall then determine and cease. The right to further regulate the furnishing of said natural gas to consumers shall be subject to such terms
196 and conditions as said common council and said company or corporation may hereafter determine upon. This ordinance and all rights herein granted shall be subject to any general ordinance or ordinances which may hereafter be adopted by the common council regulating the mode and manner of laying, relaying, and repairing the mains or pipes, conductors, connections, and drips, and the conducting of gas through the streets, lanes, alleys, squares, docks, and lands of said city not inconsistent with the provisions of this ordinance.

SECTION 9. Within 30 days after the passage of this ordinance the said company shall execute and deliver to the city of Toledo an agreement in such form as shall be approved by the city solicitor, expressing the assent of said company to and undertaking to perform the terms and requirements of this ordinance on its part, and to furnish gas to all persons requiring it in the city of Toledo (so far as said company may be able) without preference or favoritism, on equal terms and at reasonable prices, reference being had to the cost of producing and delivering the same and the prices for like supplies in other cities.

Passed Sept. 6, 1886.

Attest: H. D. STANDART, *City Clerk.*

Approved Sep. 15th, 1886.

S. F. FORBES, *Mayor.*

The foregoing is a true and correct copy of the original ordinance and minutes on file in the office of the city clerk of the city of Toledo.

G. H. COLE, *City Clerk.*

197 *An Ordinance.*

An ordinance fixing the price of natural gas to be charged by natural-gas companies in the city of Toledo for the period of three years.

SECTION 1. Be it enacted by the common council of the city of Toledo, That the natural-gas companies which have conducted their pipes and mains to or laid them in the city of Toledo, or which are conducting or laying or shall hereafter, during the term fixed in this ordinance, conduct or lay its pipes *and* to and in said city for the purpose of furnishing natural gas to the citizens of said city shall, for the period of three years from the passage of this ordinance, be entitled to charge for such gas furnished to the citizens and public buildings the prices named *and* the schedule hereinafter given, and that when said natural-gas companies or any of them shall file with the city its or their assent in writing to the terms of this ordinance, as provided in section 2479 of the Revised Statutes of Ohio, the said ordinance and acceptance shall be treated and deemed as a compliance with sections 2478 and 2479 of the Revised Statutes of the State of Ohio, and the said council shall not for the term aforesaid, by ordinance or otherwise, require said companies to furnish said gas at a price lower than that herein named: Provided that nothing herein contained shall be construed as granting to existing companies any exclusive rights or privileges or prevent any other company from furnishing natural gas to the citizens of said city.

SECTION 2. The schedule of prices hereinabove referred to is as follows:

Rates for hotel cooking made known after examination of the premises, but not to exceed the rates herein given.

The following rates will be charged for fuel gas:

For Cooking.

From November 1 to May 1.				From May 1 to November 1.			
	Monthly charges.	If paid before the 10th.			Monthly charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
No. 7 mixer	$2 78	.28	$2 50	No. 7 mixer	$1 66	.16	$1 50
No. 5 mixer	2 22	.22	2 00	No. 5 mixer	1 39	.14	1 25
No. 3 mixer	1 67	.17	1 50	No. 3 mixer	83	.08	75

For Large Cooking Range.

From November 1 to May 1.				From May 1 to November 1.			
No. 9 mixer	$3 33	.33	$3 00	No. 9 mixer	$2 22	.22	$2 00

For Laundry.

(When gas is furnished for cook stove also.)

	Monthly charges.	Discount.	Charges.		Monthly charges.	Discount.	Charges.
No. 7 mixer.....	$1 11	.11	$1 00	No. 5 mixer.....	.83	.08	.75

Manufacturers' rates for fuel shall be 75 per cent. of the cost of coal, and no more.

For Heating.

No. 7 Mixer.

	Monthly charges.	If paid before the 10th.			Annual charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
1st mixer.....	$5 00	.50	$4 50	1st mixer....	$30 00	$3 00	$27 00
2d mixer.....	4 44	.44	4 00	2d mixer.....	26 64	2 64	24 00
3d mixer.....	3 89	.39	3 50	3d mixer.....	23 34	2 34	21 00
4th mixer.....	3 33	.33	3 00	4th mixer..	19 98	1 98	18 00
5th mixer.....	2 78	.28	2 50	5th mixer...	16 68	1 68	15 00
6th mixer.....	2 22	.22	2 00	6th mixer..	13 32	1 32	12 00

No. 5 Mixer.

	Monthly charges.	If paid before the 10th.			Annual charges.	If paid before the 10th.	
		Discount.	Charges.			Discount.	Charges.
1st mixer... .	$3 89	.39	$3 50	1st mixer....	$23 34	$2 34	$21 00
2d mixer.....	3 33	.33	3 00	2d mixer....	19 98	1 98	18 00
3d mixer	2 78	.28	2 50	3d mixer.....	16 68	1 58	15 00
4th mixer.....	2 22	.22	2 00	4th mixer...	13 32	1 32	12 00
5th mixer.....	1 66	.16	1 50	5th mixer...	9 96	96	9 00
6th mixer.....	1 39	.14	1 25	6th mixer...	8 34	84	7 50

No. 3 Mixer.

For heating small rooms and for special purposes.

	Monthly charges.	If paid before the 10th.	
		Discount.	Charges.
1st mixer.....	$2 22	.22	$2 00
2d mixer.....	1 66	.16	1 50

Furnaces.

	Monthly charges.	If paid before 10th.		Annual contracts.		
		Discount.	Charges.	Annual charges.	Discount.	Charges.
"A" mixer, 21-inch fire pot...	$6 95	$ 70	$6 25	$41 70	$4 20	$37 50
"B" mixer, 24-inch fire pot...	8 66	86	7 80	51 96	5 16	46 80
"C" mixer, 26-inch fire pot...	9 44	94	8 50	56 64	5 64	51 00
"D" mixer, 28 inch fire pot...	10 00	1 00	9 00	60 00	6 00	54 00
"E" mixer, 30-inch fire pot...	11 66	1 16	10 50	69 96	6 96	63 00
"F" mixer, 35-inch fire pot...	13 89	1 39	12 50	83 34	8 34	75 00

Passed July 5, 1887.

F. I. KING,
President Board of Councilmen.
P. H. DEEGNAN,
President Board of Aldermen.

Attest: G. H. COLE, *City Clerk.*

198 EXHIBIT C TO DEP'N OF GEO. H. COLE. E. H. S., Notary.

Whereas on the 5th day of July, 1887, the common council of the city of Toledo passed and on the 7th day of July, 1887, the mayor of said city approved an ordinance regulating and fixing the minimum rates to be charged by natural-gas companies having their pipes and mains in said city for natural gas furnished by such companies to the citizens, public grounds, buildings, streets, lanes, alleys, avenues, wharfs, and landing places in such city, pursuant to sections 2478 and 2479 of the Revised Statutes of the State of Ohio, for the period of three years from the date of the passage of said ordinance; and whereas a certified copy of said ordinance has, by the city clerk of said city, been furnished to this company, and the terms of said ordinance and the schedule of prices therein fixed *has* been fully considered by this company: Now, therefore,

Resolved, That the Toledo Natural Gas Company, for itself, its successors and assigns, does hereby accept the terms of said ordinance and schedule of rates therein fixed for the period therein named; and the secretary of this company is hereby directed to make out and file with the city clerk of said city a written copy of this preamble and resolution, which shall be signed by the vice-president and secretary of this company and sealed with the seal of this company as evidence of such acceptance and approval.

Said resolution, upon motion of Milton Taylor, being seconded, was put upon its passage and unanimously adopted.

[SEAL.] L. H. SMITH,
Vice-President.
A. F. CRANE, *Secretary.*

EXHIBIT D TO DEP'N OF GEO. H. COLE. E. H. S., Notary.

To the city council of the city of Toledo and the clerk of said city:

In accordance with the terms of the ordinance passed by the city council fixing the price of natural gas for three years, and in accordance with the provisions of section 2479 of the Revised Statues of Ohio, the Northwestern Ohio Natural Gas Company hereby assents to and files its written acceptance of the terms of said ordinance.

Dated July 7, 1887.

THE NORTHWESTERN OHIO
NATURAL GAS COMPANY.
H. S. CORWIN, *Gen'l Sup't.*

199 I hereby certify that the foregoing are true and correct copies of the originals on file in the office of the city clerk of the city of Toledo.

G. H. COLE, *City Clerk.*

200 EXHIBIT E TO DEP'N OF T. R. WICKENDEN. E. H. S., Notary.

Contract for Lighting Parts of the City of Toledo with Electric Lights.

This agreement, made and concluded this 5th day of November, 1888, by and between the City of Toledo, party of the first part, and the Toledo Electric Company, party of the second part, witnesseth:

First. That the party of the first part hereby grants to the party of the second part the right and privilege of erecting and maintaining all necessary poles, supports, wires, cables, lamps, or other appurtenances in and upon such streets, lanes, alleys, public grounds, bridges, and landings as shall enable said party of the second part to fulfill and carry out the terms of this contract; said poles, supports, wires, cables, lamps, and other appurtenances to be erected subject to all ordinances governing poles and wires, and to the satisfaction of the city civil engineer and committee on gas or lighting.

2nd. This grant shall continue from the date of the approval of this contract until and including December 31st, 1893, subject to the conditions hereinafter contained, and to forfeiture and defeasance at the option of the party of the first part, in case said party of the second part shall not well and faithfully keep and perform all the covenants and conditions on its part to be kept and performed, as the same are herein contained.

3rd. Said party of the second part hereby agrees to erect and maintain, at its own cost and expense, posts, wires, & lamps, with the necessary appurtenances and fixtures, at such points on the streets, ways, and bridges of the city as are specified in the schedule marked "A" and hereto attached, and at such other points in the city as the common council may hereafter determine by ordinance within the life of this contract, and said lamps shall be lighted and the lights extinguished each and every night in the year from and including January 1st, 1889, to December 31st, 1893, and said lamps shall be lighted from dusk in the evening until daylight in the morning, and said lamps shall be standard 2,000 candle-power arcs, of either the Brush, Thompson-Houston, or United States Electric Lighting Company's system, and said lamps shall be suspended at a height of about thirty feet above the surface of the street where they are located.

4th. The party of the second part agrees to have said lamps named in the schedule attached erected and ready for use by January 1st, 1889.

5th. In consideration of the faithful and entire performance of the foregoing stipulations by the party of the second part
201 and a bond in the sum of five thousand (5,000) dollars guaranteeing the faithful performance of the same, the party of the first part hereby agrees to pay or cause to be paid to the said party of the second part for the lights herein provided for the sum of one hundred (100) dollars per lamp per year, and for lamps ordered during time covered by this contract at the same proportional rate;

and it is further agreed that should any of the lamps furnished under this contract fail to burn during any part of the hours specified in this contract the party of the first part shall, at the end of each month or oftener, notify the party of the second part of the time of such failure, and a deduction of two and one-half (2½) cents per hour shall be made from the sum above stated for each and every lamp thus reported.

The payments shall be made in the following manner to wit: For the lamps used at or in any of the public buildings of the city or any other lamps ordered by the city to be paid out of the general or any other regular fund, bills shall be rendered quarterly, and said bills shall be paid in cash, allowing a reasonable time for the passage of the claim ordinance in the regular routine of business, and for those lamps located on the various streets, the cost of which is to be assessed on the property abutting on the streets, the party of the second part shall on or before the tenth day of July of each year render bills to the city council for the sums then due on account of said lamps, and said sums shall be paid by valid assessment upon the lots and lands bounding and abutting on the streets lighted, which streets and their limits shall be defined in the ordinance providing for said lights. Said assessment shall be made payable to the auditor of the city of Toledo within ten days after the passage of the assessing ordinance; and in case said assessment or any part thereof shall remain unpaid at the expiration of said ten days said unpaid portion shall then be duly certified to the auditor of Lucas county, to be by him placed on the tax duplicate for collection.

6th. The party of the second part hereby expressly agrees to save harmless the city of Toledo from any and all damages, cost, and expense for which said city may become liable on account of any injuries or damages that may be sustained by any person or persons or corporation resulting from or on account of the right and privilege to erect and maintain posts, lines, lamps, cables, lights, &c., as granted in this contract; and in case such claim for damages shall at any time be made against said party of the first part said
202 party of the first part shall notify said party of the second part in writing of such claim, and if said party of the second part shall not within ten days thereafter satisfy such claim or notify the party of the first part that it will defend at its own cost and expense any action which may be prosecuted on such claim and save said party of the first part harmless from all damages or expenses which may grow out of the same, the party of the first part may itself settle and adjust such claims and shall have the right to recover of said party of the second part any sum of money it may have paid in such settlement or adjustment.

In witness whereof the parties have hereunto set their hands and seals the day and year first above written.

THE TOLEDO ELECTRIC COMPANY.
By THE TOLEDO ELECTRIC COMPANY.
L. S. BAUMGARDNER, *V. P.*

I hereby certify that the foregoing is a true and correct copy of the original contract on file at the office of the city clerk of the city of Toledo.

——— ———.

203 Schedule "A," referred to in the foregoing contract, gives a list of the intersections at which the lights are located.

204 EXHIBIT F to DEP'N OF T. R. WICKENDEN. E. H. S., Notary.

Contract for Lighting Parts of the City of Toledo with Electric Lights.

This agreement, made and concluded this fifth day of November, 1888, by and between the City of Toledo, party of the first part, and the Western Electric Light and Power Company, party of the second part, witnesseth:

First. That the party of the first part hereby grants to the party of the second part the right and privilege of erecting and maintaining all necessary poles, supports, wires, cables, lamps or other appurtenances in and upon such streets, lanes, alleys, public grounds, bridges, and landings as shall enable said party of the second part to fulfill and carry out the terms of this contract; said poles, supports, wires, cables, lamps, and other appurtenances to be erected subject to all ordinances governing poles and wires, and to the satisfaction of the city civil engineer and committee on gas or lighting.

2nd. This grant shall continue from the date of the approval of this contract until and including December 1st, 1893, subject to the conditions hereinafter contained, and to forfeiture and defeasance at the option of the party of the first part, in case said party of the second part shall not well and faithfully keep and perform all the covenants and conditions on its part to be kept and performed, as the same are herein contained.

3rd. Said party of the second part hereby agrees to erect and maintain, at its own cost and expense, posts, wires, & lamps, with the necessary appurtenances and fixtures, at such points on the streets, ways, and bridges of the city as are specified in the schedule marked "B" and hereto attached, and at such other points in the city southwest of Jefferson street and on the east side of Maumee river as the council may hereafter determine by ordinance within the life of this contract, and said lamps shall be lighted and the lights extinguished each and every night in the year from and including January 1st, 1889, to December 31st, 1893, and said lamps shall be lighted from dusk in the evening until daylight in the morning, and said lamps shall be standard 2,000 candle-power arcs, of the system of the Western Electric Company of Chicago, and said lamps shall be suspended at a height of about thirty feet above the surface of the street where they are located.

4th. The party of the second part agrees to have said lamps named in the schedule attached erected and ready for use by January 1st, 1889, unavoidable delays excepted.

205 5th. In consideration of the faithful and entire performance of the foregoing stipulations by the party of the second part and a bond in the sum of five thousand (5,000) dollars, guaranteeing the faithful performance of the same, the party of the first — hereby agrees to pay or cause to be paid to the said party of the second part for the lights herein provided for the sum of one hundred (100) dollars per lamp per year, and for lamps ordered during time covered by this contract at the same proportional rate; and it is further agreed that should any of the lamps furnished under this contract fail to burn during any part of the hours specified in this contract the party of the first part shall, at the end of each month or oftener, notify the party of the second part of the time of such failure, and a deduction of two and one-half (2½) cents per hour shall be made from the sum above stated for each and ever lamp thus reported. The payments shall be made in the following manner, to wit: For the lamps used at or in any of the public buildings of the city or any other lamps ordered by the city to be paid out of the general or any other regular fund, bills shall be rendered quarterly, and said bills shall be paid in cash, allowing a reasonable time for the passage of the claim ordinance in the regular routine of business, and for those lamps located on the various streets, the cost of which is to be assessed on the property abutting on the streets, the party of the second — shall on or before the tenth day of July of each year render bills to the city council for the sums then due on account of said lamps, and said sums shall be paid by valid assessments upon the lots and lands bounding and abutting on the streets lighted, which streets and their limits shall be defined in the ordinance providing for said lights. Said assessment shall be made payable to the auditor of the city of Toledo within ten days after the passage of the assessing ordinance; and in case said assessment or any part thereof shall remain unpaid at the expiration of said ten days said unpaid portion shall then be duly certified to the auditor of Lucas county, to be by him placed on the tax duplicate for collection.

6th. The party of the second part hereby expressly agrees to save harmless the city of Toledo from any and all damages, cost, and expense for which said city may become liable on account of any injuries or damages that may be sustained by any person or persons or corporation resulting from or on account of the right and privilege to erect and maintain posts, lines, lamps, cables, lights, &c., as granted in this contract; and in case such claim for damages
206 shall at any time be made against said party of the first part said party of the first part shall notify said party of the second part in writing of such claim, and if said party of the second part shall not within ten days thereafter satisfy such claim or notify the party of the first part that it will defend at its own cost and expense any action which may be prosecuted on such claim and save said party of the first part harmless from all damages or expenses which may grow out of the same, the party of the first party may itself settle and adjust such claims and shall have the right to re-

cover of said party of the second part any sum of money it may have paid in such settlement or adjustment.

In witness whereof the parties have hereunto set their hands and seals the day and year first above written.

THE WESTERN ELECTRIC LIGHT AND POWER COMPANY,
By H. S. WALBRIDGE, *Vice-President.*

Confirmed by the common council of the city of Toledo by resolution adopted November 12th, 1888.

I hereby certify that the foregoing is a true and correct copy of the original contract on file in the office of the city clerk of Toledo, Lucas county, Ohio.

—— ——.

207 The Schedule "B" referred to in the foregoing contract gives a list of the intersections at which the lights are located.

208 EXHIBIT No. 1. Oct. 25, 1889. E. H. Smith, Stenographer.

Warranty Deed with Dower.

Know all men by these presents that we, Jessup W. Scott and Susan Scott, in consideration of fifty-five thousand dollars to us paid by John B. Carson, the receipt whereof is hereby acknowledged, do hereby bargain, sell, and convey to the said John B. Carson, his heirs and assigns forever, the following real estate, viz:

Lot number nine (9) and all that part of lot number ten (10) not conveyed by William Oliver to Willard J. and Munson H. Daniels in 1834, all in the Port Lawrence division of the city of Toledo, Lucas county, Ohio, the part of said lot No. ten (10) which is hereby conveyed being the southwesterly part of said lot and having a frontage on Summit street of thirty-three and a half (33½) feet, more or less, and extending back the same width to the alley in
209 the rear of said lot, together with the privileges and appurtenances to the same belonging:

To have and to hold the same to the said John B. Carson, his heirs and assigns forever, we hereby covenanting that at the date hereof we are lawfully — of said above-described premises and have good right to convey the same, and that the title so conveyed is clear, free, and unincumbered, and that we will warrant and defend the same against all claims whatsoever.

210 And I, Susan Scott, wife of the said Jesup W. Scott, in consideration of one dollar to me in hand paid, do remise, release, and forever quitclaim unto the said grantee all my right, by way of dower or otherwise, in and to the above-granted premises.

In witness whereof the said Jesup W. Scott and Susan Scott

have hereunto set their hands and seals this first day of February, in the year eighteen hundred and seventy-three.

JESUP W. SCOTT. [SEAL.]
SUSAN SCOTT. [SEAL.]

Signed, sealed, and delivered in presence of—
J. P. PUGSLEY.
HENRY R. DONN.

THE STATE OF OHIO, } ss:
Lucas County, }

Be it remembered that on the first day of February, in the year of our Lord one thousand eight hundred and seventy-three, before me, the subscriber, a notary public within and for said county, personally came Jesup W. Scott and Susan Scott, the grantors in the above conveyance, and acknowledged the signing and sealing thereof to be their voluntary act and deed for the purpose therein mentioned; and the said Susan Scott, wife of the said Jesup W. Scott, being examined by me separate and apart from her said husband and the contents of said deed made known and explained to her, did declare that she did voluntarily sign, seal, and acknowledge the same, and that she was still satisfied therewith, as her act and deed, for the uses and purposes therein mentioned.

In testimony whereof I have hereunto subscribed my name and affixed my official seal on the day and year aforesaid.

[SEAL.] ISAAC P. PUGSLEY,
Notary Public, Lucas Co., Ohio.

211 [Endorsed:] Certified copy. Warranty deed, with dower, from Jesup W. Scott & wife to John B. Carson. Date, ——. Transferred Feb. 1, 1873. E. W. Lenderson, county auditor. Recorder's office, Lucas county. Received for record February 1st, 1873, and recorded in vol. 76 of Deeds, page 133, March 8, 1873. Josiah W. White, recorder.

I, Wm. V. McMaken, recorder of Lucas county, Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain warranty deed executed by Jesup W. Scott & wife to John B. Carson, bearing date of Feb'y 1st, 1873, and duly recorded in my office Feb'y 1st, 1873, in vol. 76 of Deeds, p. 133.

Witness my hand and official seal this 22nd day of October, 1889.

[SEAL.] WM. V. McMAKEN,
Recorder, Lucas Co., Ohio.

212 EXHIBIT No. 2. Oct. 25, 1889. E. H. Smith, Stenographer.

Warranty Deed, with Dower.

Know all men by these presents that we, John D. Crennan and Catharine Crennan, of Toledo, Lucas county, Ohio, in consideration of nine thousand ($9,000.00) dollars to us paid by John B. Carson,

of Toledo, Lucas county, Ohio, the receipt whereof is hereby acknowledged, do hereby bargain, sell, and convey to the said John B. Carson, of Toledo, Ohio, his heirs and assigns forever, the following real estate, viz:

213 Lot number fifty-seven (No. 57), in the Port Lawrence division of the city of Toledo, Lucas county, State of Ohio, together with the privileges and appurtenances to the same belonging:

To have and to hold the same to the said John B. Carson, of Toledo, Lucas county, Ohio, his heirs and assigns forever, we hereby covenanting that the title so conveyed is clear, free, and unincumbered, and that we will warrant and defend the same against all claims whatsoever excepting one-half ($\frac{1}{2}$) of the taxes on said lot for the year 1870.

214 And I, Catharine Crennan, wife of the said John D. Crennan, of Toledo, Ohio, in consideration of one dollar to me in hand paid, do remise, release, and forever quitclaim unto the said grantee all my right, by way of dower or otherwise, in and to the above-granted premises.

In witness whereof the said John D. Crennan and Catharine Crennan, of Toledo, Ohio, hereunto set our hands and seals this 11th day of November, in the year eighteen hundred and seventy.

J. D. CRENNAN. [SEAL.]
CATHARINE CRENNAN. [SEAL.]

Signed, sealed, and delivered in presence of—

HENRY LORENZ.
B. F. HOLLISTER.

[Internal revenue stamp, $9. J. D. C. 11, 11, '70.]

THE STATE OF OHIO, *Lucas County,* } ss:

Be it remembered that on the 11th day of November, in the year of our Lord one thousand eight hundred and seventy, before me, the subscriber, a notary public within and for said county, personally came John D. Crennan and Catharine Crennan, of Toledo, Ohio, the grantors in the above conveyance, and acknowledged the signing and sealing thereof to be their voluntary act and deed for the purpose therein mentioned; and the said Catharine Crennan, wife of the said John D. Crennan, being examined by me separate and apart from her said husband and the contents of said deed made known and explained to her, did declare that she did voluntarily sign, seal, and acknowledge the same, and that she is still satisfied therewith as her act and deed for the uses and purposes therein mentioned.

In testimony whereof I have hereunto subscribed my name and affixed my official seal on the day and year aforesaid.

HENRY LORENZ,
[SEAL.] *Notary Public, Lucas County, Ohio.*

215 [Endorsed:] Certified copy warranty deed, with dower, from John D. Crennan & wf. to John B. Carson. Transferred Nov. 24, 1870. E. W. Lenderson, county auditor. Recorder's office, Lucas county. Received for record Nov. 24, 1870, and recorded in vol. 65 of Deeds, page 485, Nov. 30, 1870. Josiah W. White, recorder.

I, Wm. V. McMaken, recorder of Lucas county, Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain warranty deed executed by J. D. Crennan & wf. to John B. Carson, bearing date of Nov. 11th, A. D. 1870, and duly recorded in my office Nov. 24th, A. D. 1870, in vol. 65 of Deeds, page 485.

Witness my hand and official seal this 22d day of Oct., A. D. 1889.

WM. V. McMAKEN,

[SEAL.] *Recorder Lucas Co., O.*

216 EXHIBIT No. 3. Oct. 25, 1889. E. H. Smith, Stenographer.

Warranty Deed, with Dower.

Know all men by these presents that I, Frederick Prentice, in consideration of ninety-two thousand dollars to me paid by Horace F. Clarke, of New York city, the receipt whereof is hereby acknowledged, do hereby bargain, sell, and convey to the said Horace F. Clark, his heirs and assigns forever, the following real estate, viz:

That part of the west half of section number three (3), in township number three (3), of the United States reserve of twelve miles square at the foot of the rapids of the Miami of Lake Erie, county of Lucas and State of Ohio, bounded and described as follows, to wit: Commencing on the west line of said section at the southwest corner of lands conveyed to William Oliver in partition by deed dated June —, 1847, and running thence east on the line of the lands so conveyed to said Oliver to the east line of the west half of said section; thence south along said last-mentioned line nineteen chains and one link; thence west on a line parallel to said line of lands conveyed to said Oliver to the west line of said section, and thence north on said west line of said section to the place of the beginning, containing seventy-eight & $\frac{2}{100}$ths acres of land, more or less, and lying adjoining and next north of land owned by the Michigan Southern and Lake Shore Railroad Company and being the same land
217 conveyed to said grantor by Harriet O. Hall, together with the priviliges and appurtenances to the same belonging:

[$92 U. S. R. F. P. May 4, 1872.]

To have and to hold the same to the said Horace F. Clark, his heirs and assigns forever, I hereby covenanting that the title so conveyed is clear, free, and unincumbered, and that I will warrant and defend the same against all claims whatsoever.

218 And I, Mary J. Prentice, wife of the said Frederick Prentice, in consideration of one dollar to me in hand paid, do remise, release, and forever quitclaim unto the said grantee all —

right, by way of dower or otherwise, in and to the above-granted premises.

In witness whereof the said Frederick Prentice and Mary J. Prentice hereunto set our hands and seals this fourth day of May, in the year eighteen hundred and seventy-two.

F. PRENTICE. [SEAL.]
MARY JANE PRENTICE. [SEAL.]

Signed, sealed, and delivered in presence of—
WILLIAM C. LUSK,
CHARLES NETTLETON,
As to M. J. P.
HENRY W. TEUKSBURY,
CHAS. C. STARR,
As to F. Prentice.

THE STATE OF NEW YORK, *New York City and County,* } ss:

Be it remembered that on the sixth day of May, in the year of our Lord one thousand eight hundred and seventy-two, before me, the subscriber, a commissioner within and for said county and State, personally came Mary Jane Prentice, the grantor in the above conveyance, and acknowledged the signing and sealing thereof to be her voluntary act and deed for the purpose therein mentioned; and the said Mary Jane Prentice, being examined by me separate and apart from her said husband and the contents of said deed made known and explained to her, did declare that she did voluntarily sign, seal, and acknowledge the same, and that she is still satisfied therewith as her act and deed for the uses and purposes therein mentioned.

In testimony whereof I have hereunto subscribed my name and affixed my official seal on the day and year aforesaid.

CHARLES NETTLETON, [SEAL.]
Commissioner for Ohio in New York,
117 *Broadway, N. Y. City.*

219 [Endorsed:] Certified copy warranty deed, with dower, from Frederick Prentice & wf. to Horace F. Clark. Transferred May 10th, 1872. E. W. Lenderson, county auditor. Recorder's office Lucas county. Received for record May 10th, 1872, and recorded in vol. 70 of Deeds, page 363, June 7th, 1872. Josiah W. White, recorder.

STATE OF OHIO, *Lucas County,* } ss:

Be it remembered that on the ninth day of May, A. D. 1872, before me, a notary public within and for said Lucas county & State of Ohio, personally came Frederick Prentice, one of the grantors in the foregoing conveyance, and acknowledged the signing and sealing thereof to be his voluntary act and deed for the purpose therein mentioned.

In testimony whereof I have hereunto subscribed my name officially and have affixed my official seal on the day and year last above written.

CHAS. C. STARR,
Notary Public, Lucas County, Ohio. [SEAL.]

I, Wm. V. McMaken, recorder of Lucas county, Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain warranty deed executed by F. Prentice & wf. to Horace F. Clark, bearing date of May 4th, A. D. 1872, and duly recorded in office May 10th, A. D. 1872, in vol. 70 of Deeds, page 363.

Witness my hand and official seal this 22d day of Oct., A. D. 1889.

[SEAL.] WM. V. McMAKEN,
Recorder, Lucas County.

220 EXHIBIT No. 4. October 25, 1889.

Q. C. D.

Maria Louise Clark *et al.*
to
Augustus Schell.

This indenture, made this second day of June, in the year one thousand eight hundred and seventy-four, between Maria Louise Clark, of the city of New York, widow of Horace F. Clark, deceased; Clarence L. Collins and Maria Louise Collins, his wife, also of said city of New York, the said Maria Louise Collins being the only child and heir-at-law of said Horace F. Clark, and the said Maria Louise Clark and the said Maria Louise Collins being the devisees in and by the last will of said Horace F. Clark of the lands and premises hereinafter described, parties of the first part, and Augustus Schell, of the city of New York aforesaid, party of the second part, witnesseth:

That the said parties of the *second* part, for and in consideration of one dollar to them paid, the receipt whereof is hereby acknowledged, have granted, bargained, sold, and conveyed, and by these presents do grant, bargain, sell, and convey, to the said party of the second part all that part of the west half of section number three (3), in township number three (3), of the United States reserve of twelve miles square at the foot of the rapids of the Miami of Lake Erie, county of Lucas and State of Ohio, bounded and described as follows, to wit: Commencing on the west line of said section at the southwest corner of lands conveyed to William Oliver in partition by deed dated June —, 1847, and running thence east on the line of the lands so conveyed to said Oliver to the east line of the west half of said section; thence south along said last-mentioned line nineteen chains and one link; thence west on a line parallel to said line of lands conveyed to said Oliver to the west line of said section, and thence north on said west line of said section to the place of begin-

ning, containing seventy-eight and $\frac{2}{100}$ths acres of land, more or less, and lying adjoining and next north of land owned by the Michigan Southern and Lake Shore Railroad Company and being the same land conveyed by Frederick Prentice and wife to Horace F. Clark by deed bearing date May 4th, 1872, excepting and reserving therefrom all that part of the said above-described land and premises which lies north of the centre line of Nebraska avenue extended, containing ten $\frac{762}{1000}$ths acres; to have and to hold the above granted and bargained premises, with the appurtenances thereto belonging, unto the said Augustus Schell, his heirs and assigns
221 forever; and the said Maria Louisa Clark and Maria Louise Collins do for themselves, their heirs, executors, and administrators, covenant with the said Augustus Schell, his heirs and assigns, that at and until the ensealing of these presents neither they nor the said Horace F. Clark in his lifetime have in any manner encumbered or suffered to be encumbered the said premises, nor has the title to the same subsequent to its vesting in said Clark been in any manner impaired by any act of the said Horace F. Clark in his lifetime or of the said Maria Louisa Clark or the said Maria Louise Collins since his death; and the said Maria Louisa Clark, widow of the said Horace F. Clark, doth remise, release, and forever quitclaim unto the said August Schell, his heirs and assigns, all her right and title of dower in the above-described premises.

In witness whereof the parties hereto have hereunto interchangeably set their hands and seals the day and year first above written.

MARIA LOUISE CLARK. [SEAL.]
MARIA LOUISE COLLINS. [SEAL.]
CLARENCE L. COLLINS. [SEAL.]

Signed, sealed, and delivered in the presence of—

ROB'T J. NIVES.
LOUIS FELLOWS.

STATE OF NEW YORK,
City & County of New York, } ss:

Be it remembered that on the second day of June, A. D. 1874, before me, Louis Fellows, a notary public in and for the city and county of New York, duly commissioned and sworn, residing in said city, personally appeared Maria Louisa Clark and Maria Louisa Collins, wife of Clarence L. Collins, and the said Clarence L. Collins, known to me to be the individuals described in and who executed the foregoing instrument, and severally acknowledged the signing and sealing of the foregoing instrument to be their voluntary act and deed; and the said Maria Louisa Collins, wife of Clarence L. Collins, being at the same time examined by me separate and apart from her husband and the contents of said instrument made known to her by me, she then declared that she did voluntarily sign, seal, and acknowledge the same, and that she was still satisfied therewith as her act and deed.

In witness whereof I have hereunto set my hand and affixed my official seal on the day and year last above written.

[SEAL.] LOUIS FELLOWS,
50, *Notary Public N. Y. Co.*

STATE OF NEW YORK, }
City and County of New York, } *ss:*

I, William Walsh, clerk of the city and county of New York and also clerk of the supreme court for the said city and county,
222 the same being a court of record, do hereby certify that Louis Fellows, whose name is subscribed to the certificate of the proof or acknowledgment of the annexed instrument and thereon written, was at the time of taking such proof or acknowledgment a notary public in and for the city and county of New York, dwelling in the said city, commissioned and sworn and duly authorized to take the same; and, further, that I am well acquainted with the handwriting of such notary and verily believe that the signature to the said certificate of proof or acknowledgment is genuine. I further certify that said instrument is executed and acknowledged according to the laws of the State of New York.

In testimony whereof I have hereunto set my hand and affixed the seal of the said court and county the 3d day of June, 1874.

WM. WALSH, *Clerk.* [SEAL.]

Transferred Feb'y 5th, 1876.

G. WITTSTEIN,
P'r D.

Received for record Feb. 5th, 1876, and recorded Feb'y 7th, 1876.

JOHN S. KOUNTZ, *Recorder.*

I, Wm. V. McMaken, recorder of Lucas Co., Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain quitclaim deed executed by Maria Louise Clark *et al.* to Augustus Schell, bearing date of June 2d, 1874, and duly recorded in my office Feb'y 5th, 1876, in vol. 93 of Deeds, page 298.

Witness my hand and official seal this 23rd day of October, 1889.

WM. V. McMAKEN,
[SEAL.] *Recorder of Lucas Co., O.*

[Endorsed:] Certified copy of quitclaim deed from Maria Louise Clark *et al.* to Augustus Schell. Lucas county recorder's office. Transferred Feb. 5th, 1876. G. Wittstein, p'r D. Received for record Feb. 5th, 1876. Recorded in vol. 93 of Deeds, page 298, Feb'y 7th, 1876. John S. Kountz, recorder.

223 EXHIBIT No. 5. October 25, 1889. E. H. Smith, Stenographer.

T. Deed.

Norman C. Baldwin, Trustee,
to
Wallace C. Andrews, Trustee.

Know all men by these presents that I, Norman C. Baldwin, of Cleveland, Ohio, for and in consideration of the sum of one dollar, to me in hand paid by Wallace C. Andrews, of Cleveland aforesaid, the receipt of which I do hereby acknowledge, and for the purpose of conveying to said Andrews and vesting in him in trust the legal title heretofore held by me in trust for him and others to the property hereinafter described, do hereby give, grant, bargain, sell, and convey to the said Wallace C. Andrews, his heirs and assigns forever, in trust as hereinafter set forth, the following-described several tracts or parcels of land, situate in the city of Toledo, county of Lucas, and State of Ohio, and described as follows, viz:

The south half (½) of the south half (½) of the northwest quarter (¼) of section number twenty-six (26), in town. number nine (9) south of range No. seven (7) east, containing forty (40) acres of land, and being the same lands conveyed to me by George G. Keeler and Valentine H. Ketcham and wife by deeds dated January 1st, 1873, and recorded in volume 75 of Deeds, at pages 300, 536, and 537 thereof, in the records of said Lucas county, Ohio; also the south half (½) of the north half (½) of the south half (½) of the northwest quarter (¼) of section number twenty-six (26), in township No. nine (9) south of range No. seven (7) east, in Lucas county, Ohio, except that part which lies west of the Maumee and Monroe turnpike, the part not excepted containing about twenty (20) acres of land, and being the same land conveyed to me by Harriet T. Earl and William C. Earl by deed dated January 1st, 1873, and recorded in volume 75 of Deeds, at pages 360 & 361 thereof, in the records of deeds of Lucas county, Ohio; also that part of the west half (½) of the southwest quarter (¼) of section No. twenty-six (26), in town. No. nine (9) south of range No. seven (7) east, in the county of Lucas and State of Ohio, bounded and described as follows, to wit: Commencing at the northeast corner of said west half of the southwest quarter of section No. 26, town. 9 south of range 7 east, thence west on the half-section line fifty (50) rods; thence south, parallel with the east line of said west half, thirty-two (32) rods; thence east, parallel with the north line, fifty (50) rods to the east line of said west half; thence north along said east line (32) thirty-two rods to the place of beginning, containing ten (10) acres, and being the north half of twenty (20) acres
224 conveyed by George B. Brown and wife to Joseph Paige November 18th, 1871, and being the same land conveyed by said Joseph Paige and Sarah C. Paige, his wife, to Norman C. Baldwin by deed dated January 10th, 1873, and recorded in volume 82 of Deeds, at pages 115, 116, 117, & 118 thereof, in the records of Lucas

county, Ohio; also the north four (4) acres of that part of the east half ($\frac{1}{2}$) of the southeast quarter ($\frac{1}{4}$) of section number twenty-seven (27) and of the west ten (10) acres of the southwest quarter ($\frac{1}{4}$) of section No. twenty-six (26), in town. nine (9) south of range No. seven (7) east, in said Lucas county, Ohio, lying east of the center of the Sandusky and Detroit turnpike, so called, being the same four (4) acres conveyed by said Joseph Paige and wife to said Norman C. Baldwin by the deed above mentioned, dated January 10th, 1873, and being the same land conveyed to said Paige by Thomas P. Whitney and wife by deed dated May 27th, 1872, and recorded in volume 70, at page 428, in Lucas County Records of Deeds; also that parcel of land situated in said city of Toledo, Lucas county, Ohio, and described as follows: Being eight and eighty-four one-hundredths ($8\frac{84}{100}$) acres off from the north side of the east half ($\frac{1}{2}$) of the southwest quarter ($\frac{1}{4}$) of section No. twenty-six (26), town. No. nine (9) south of range seven (7) east, and adjoining on the north land known as the Keeler farm, which said eight and $\frac{84}{100}$ acres is about eighty (80) rods long and about two hundred and ninety-one (291) feet wide, including its portion of the Territorial road, so called, but excepting therefrom a parcel of land one hundred and thirty-two (132) feet front on said Territorial road and two hundred and fifty (250) feet deep, sold to A. Andrews June 11th, 1872, the said parcel of land hereby conveyed containing eight (8) acres of land, and being the same land conveyed to said Joseph Paige by Wm. H. Smith and wife by deed dated March 6th, 1872, excepting the parcel so conveyed to said Andrews, and being the same land conveyed to said Norman C. Baldwin by said Paige by said deed above mentioned, dated January, 10th, 1873, and recorded in volume 82 of Deeds, at pages 115 to 118; also thirty-five (35) feet in width off of the north end of that part of the west half ($\frac{1}{2}$) of the southwest quarter ($\frac{1}{4}$) of section No. twenty-six (26), in town. No. nine (9) south of range No. seven (7) east, in the county of Lucas and State of Ohio, which is marked on the Marston map of the city of Toledo Mrs. J. R. St. John and more particularly described as follows: Commencing at a point on the north line of said half quarter section one hundred and sixty-three & $\frac{80}{100}$ feet east of the northwest corner thereof, thence
225 east on the north line of said half quarter section three hundred and twenty-seven & $\frac{59}{100}$ feet (327.59); thence south thirty-five (35) feet; thence west, parallel with the north line of said half quarter section, three hundred and twenty-seven & $\frac{59}{100}$ feet (327.59); thence north thirty-five (35) feet to the place of beginning, being the same land conveyed to said Norman C. Baldwin by James A. Corbusier and others by deed dated October 30th, 1875, and recorded in volume 93 of Deeds, at pages 134 & 135 thereof, in the records of said Lucas county, Ohio; also that part of the north half ($\frac{1}{2}$) of the south half ($\frac{1}{2}$) of the northeast quarter ($\frac{1}{4}$) of section No. twenty-seven (27), in town. No. nine (9) south, of range No. seven (7) east, in Lucas county, Ohio, described as follows: Commencing at a hub at the intersection of the line running between the land formerly owned by the heirs of the late Major C. Keeler and land lately owned by W. C. Earl with the section line between sections

twenty-six (26) and twenty-seven (27), thence running westerly in the direction of the first-mentioned line (viz., along the south line of the north half of the south half of the northeast quarter of section 27) to the center line of United States turnpike; thence northeasterly along the center of said turnpike to its intersection with the section line between sections 26 and 27; thence south along said section line to the place of beginning, being that triangular piece of land lying west of said land formerly owned by W. C. Earl and between it and the United States turnpike, and being the same land conveyed by Alexander Henderson and wife to said Joseph Paige February 6th, 1873, and conveyed by said Paige to said Norman C. Baldwin by deed dated February 7th, 1873, and duly recorded in the records of deeds of said Lucas county, Ohio, but excepting and reserving from and out of the premises hereinbefore described the following-described parcels of land heretofore sold and conveyed by said Norman C. Baldwin as trustee, to wit: Lots Nos. eighty-two (82) and eighty-three (83) in the Robinwood Addition (extension), in the city of Toledo, Lucas county, Ohio, being the same land conveyed by Norman C. Baldwin to Joseph Paige by deed dated May 3rd, 1878, and recorded in volume 102 of Deeds, at page 632 thereof, in the records of said Lucas county, Ohio; also that part of the northwest quarter (¼) of section 26, in town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point on the west line of Collingwood avenue or Territorial road, so called, ninety-eight (98) feet north of the east and west center line of said section 26, thence west, at right angles to said road, two hundred and twenty-five (225)
226 feet; thence north, parallel with said west line of said road, sixty-five (65) feet; thence east, parallel with said first line, two hundred and twenty-five (225) feet; thence south to the place of beginning, being the same land conveyed by Norman C. Baldwin to George G. Keeler by deed dated June 1st, 1873, and recorded in volume 65 of Deeds, at page 513, in the records of said Lucas county, Ohio; also that part of the southwest quarter (¼) of said section No. 26, town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Beginning at a point three hundred and fifty (350) feet west of the west line of Collingwood avenue and sixty-eight (68) feet south of the east and west center line of said section No. 26, thence west one hundred (100) feet, parallel with said east and west center line; thence south two hundred and twenty-four (224) feet, parallel with said west line of Collingwood avenue; thence east one hundred (100) feet, parallel with said east and west center line; thence north two hundred and twenty-four (224) feet to the place of beginning, being the same land conveyed by N. C. Baldwin to Amelie Schiely by deed dated May 15th, 1873, and recorded in volume 75 of Deeds, at page 598, of the records of said Lucas county, Ohio; also that part of the southwest quarter (¼) of said section 26, town. 9 south, of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point four hundred and fifty (450) feet west of the west line of Collingwood avenue and sixty-eight (68) feet south of the east and west center line of said section 26, thence west one

hundred (100) feet, parallel with said east and west center line; thence south to the north line of land of Louis Wenz, parallel with the west line of Collingwood avenue; thence east one hundred (100) feet parallel with said east and west center line; thence north to the place of beginning, being the same land conveyed by Norman C. Baldwin to Nancy M. Coon by deed dated June 27th, 1873, and recorded in volume 77 of Deeds, at page 504 thereof, in the records of deeds of said Lucas county, Ohio; also that part of the southwest quarter of said section 26, town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point two hundred and fifty (250) feet west of Collingwood avenue and sixty-eight (68) feet south of the east and west center line of said section No. 26, thence west one hundred (100) feet, parallel with said east and west center line; thence south two hundred and twenty-four (224) feet, parallel with said west line of Collingwood avenue; thence east one hundred (100) feet, parallel with said east and west center line; thence north to the place of beginning, being the same land conveyed by said Norman
227 C. Baldwin to Joseph Paige by deed dated about February 20th, 1879, and duly recorded in the records of Lucas county, Ohio, be the premises hereby conveyed more or less, but subject to all legal highways; to have and to hold the above granted and bargained premises, with all the hereditaments and appurtenances thereunto belonging, with the exceptions above named, unto the said Wallace C. Andrews, his heirs and assigns forever, in trust for the use, behoof, and benefit of the said Wallace C. Andrews, Norman C. Baldwin, and David M. Marsh and their respective heirs and assigns in the proportions following—that is to say: To the said Wallace C. Andrews and his heirs and assigns, nine-twenty-fourths ($\frac{9}{24}$); to the said David M. Marsh and his heirs and assigns, nine-twenty-fourths ($\frac{9}{24}$), and to the said Norman C. Baldwin and his heirs and assigns, six-twenty-fourths ($\frac{6}{24}$) of the premises hereby conveyed, and the like interest and title in and to the rents, issues, and profits of said premises and the proceeds of any sales of any part thereof, but subject to the payment by said Andrews, as such trustee, in behalf of himself and said David M. Marsh, of two-thirds ($\frac{2}{3}$) of the sum of sixteen thousand dollars ($16,000), with the interest unpaid and to accrue thereon, for which said Norman C. Baldwin, as trustee for himself and said Marsh and Andrews, executed his four (4) promissory notes of four thousand dollars each to Valentine H. Ketcham, dated January 1st, 1873, and falling due, respectively, January 4th, 1880, 1881, 1882, and 1883, all with interest at eight per cent. per annum, payable annually; the payment of said two-thirds ($\frac{2}{3}$) of which said sum of sixteen thousand dollars and the interest thereof is hereby charged upon said land and assumed by said Andrews in his said capacity of trustee; and I, the said Norman C. Baldwin, do, for myself and my heirs, executors, and administrators, covenant with the said Wallace C. Andrews, trustee, his heirs and assigns, that at and until the ensealing of these presents I am well seized of the above-described premises as a good and indefeasible estate in fee simple, and have good right to bargain

and sell the same in manner and form as above written, and that the same are free from all encumbrances whatsoever except said two-thirds of said sixteen thousand dollars and interest, and that I will warrant and defend said premises hereby conveyed, with the appurtenances thereunto belonging, to the said Wallace C. Andrews, trustee, his heirs and assigns forever, against all lawful claims and demands whatsoever except said two-thirds of said sixteen thousand dollars and interest so assumed and to be paid by said grantee as trustee.

228 In witness whereof I hereunto set my hand and seal, at Cleveland, Ohio, this third day of May, in the year of our Lord one thousand eight hundred and seventy-nine.

NORMAN C. BALDWIN. [SEAL.]

Signed, sealed, and delivered in presence of—

CHAS. M. VORCE.
I. H. MANSFIELD.

STATE OF OHIO, *Cuyahoga County,* } ss:

On this third day of May, A. D. 1879, before me, a notary public in and for said county, personally appeared the above-named Norman C. Baldwin and acknowledged that he did sign and seal the foregoing instrument, and that the same is his free act and deed.

In witness whereof I hereunto set my hand and official seal this 3rd day of May, A. D. 1879, at Cleveland, in said county.

[SEAL.] CHAS. M. VORCE,
Notary Public.

I, Wm. V. McMaken, recorder of Lucas Co., Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain trustee deed executed by Norman C. Baldwin, trustee, to Wallace C. Andrews, trustee, bearing date of May 3d, A. D. 1879, and duly recorded in my office Nov. 3d, 1879, in vol. 109 of Deeds, pages 26 to 30, inc.

Witness my hand and official seal this 23d day of October, A. D. 1889.

[SEAL.] WM. V. McMAKEN,
Recorder of Lucas Co., O.

[Endorsed:] Certified copy of trustee deed from Norman C. Baldwin, trustee, to Wallace C. Andrews, trustee. Lucas county, recorder's office. Transferred Nov. 3rd, 1879. J. P. Jones, auditor. H. Received for record Nov. 3rd, 1879. Recorded in vol. 109 of Deeds, page 26, Nov. 6th, 1879. Isaac Head, recorder.

229 EXHIBIT No. 6. Oct. 25, 1889. E. H. Smith, Stenographer.

Q. C. D.

Thomas C. St. John & wf.
to
Wallace C. Andrews.

This indenture, made the eighteenth day of September, in the year of our Lord one thousand eight hundred and eighty-four, between Thomas C. St. John and Lucinda St. John, his wife, of Willoughby, county of Lake and State of Ohio, party of the first part, and Wallace C. Andrews, of the city, county, and State of New York, party of the second part, witnesseth:

That the said parties of the first part, for and in consideration of the sum of one dollar, lawful money of the United States of America, to us in hand paid by the said party of the second part at or before the ensealing and delivery of these presents, the receipt whereof is hereby acknowledged, have remised, released, and forever quitclaimed, and by these presents do remise, release, and forever quitclaim, unto the said party of the second part and to his heirs and assigns forever all the following-described several "tracks" or parcels of land, situate in the city of Toledo, county of Lucas and State of Ohio, and described as follows, viz:

The south half (½) of the south half (½) of the northwest quarter (¼) of section number twenty-six (26), in town. number nine (9) south of range No. seven (7) east, containing forty (40) acres of land and being the same lands conveyed by George G. Keeler and Valentine H. Ketcham and wife by deeds dated January 1st, 1873, and recorded in volume 75 of Deeds, at pages 300–536 and 537 thereof, in the records of said Lucas county, Ohio; also the south half (½) of the north half (½) of the south half (½) of the northwest quarter (¼) of section number twenty-six (26), in township No. nine (9) south of range No. seven (7) east, in Lucas county, Ohio, except that part which lies west of the Maumee and Monroe turnpike, the part not excepted containing about twenty (20) acres of land and being the same land conveyed by Harriet T. Earl and William C. Earl by deed dated January 1st, 1873, and recorded in volume 75 of Deeds, at pages 360 & 361 thereof, in the records of deeds of Lucas county, Ohio; also that part of the west half (½) of the southwest quarter (¼) of section number twenty-six (26), in town. number nine (9) south of range No. seven (7) east, in the county of Lucas and State of Ohio, bounded and described as follows, to wit: Commencing at the northeast corner of said west walf of the southwest quarter of section No. 26, town. 9 south of range 7 east, thence west on the half-section line fifty rods (50) *rods;* thence south
230 parallel with the east line of said west half thirty-two rods; thence east parallel with the north line fifty (50) rods to the east line of said west half; thence north along said east line (32) thirty-two rods to the place of beginning, containing ten (10) acres and being the north half of twenty acres conveyed by

George B. Brown and wife to Joseph Paige November 18th, 1871, and being the same land conveyed by said Joseph Paige and Sarah C. Paige, his wife, to Norman C. Baldwin by deed dated January 10th, 1873, and recorded in volume 82 of Deeds, at pages 115, 116, 117, & 118 thereof, in the records of Lucas county, Ohio; also the north four (4) acres of that part of the east half ($\frac{1}{2}$) of the southeast quarter ($\frac{1}{4}$) of section number twenty-seven (27) and of the west ten (10) acres of the southwest quarter ($\frac{1}{4}$) of section number twenty-six (26), in town. nine (9) south of range No. seven (7) east, in said Lucas county, Ohio, lying east of the center of the Sandusky and Detroit turnpike, so called, being the same four acres conveyed by said Joseph Paige and wife to said Norman C. Baldwin by deed above mentioned, dated January 10th, 1873, and being the same land conveyed to said Paige by Thomas P. Whitney and wife by deed dated May 27th, 1872, and recorded in volume 70, at page 428, in Lucas County Records of Deeds; also that parcel of land situate in said city of Toledo, Lucas county, Ohio, and described as follows: Being eight and eighty-four one-hundredths (8.84) acres off from the north side of the east half ($\frac{1}{2}$) of the southwest quarter ($\frac{1}{4}$) of section No. twenty-six (26), town. No. nine (9) south of range seven (7) east, and adjoining on the north land known as the Keller farm, which said eight and $\frac{84}{100}$ acres is about eighty (80) rods long and about two hundred and ninety-one (291) feet wide, including its portion of the Territorial road, so called, but excepting therefrom a parcel of land one hundred and thirty-two (132) feet front on said Territorial road and two hundred and fifty (250) feet deep sold to A. Andrews June 11th, 1872, the said parcel of land hereby conveyed containing eight (8) acres of land and being the same land conveyed to said Joseph Paige by Wm. H. Smith and wife by deed dated March 6th, 1872, excepting the parcel so conveyed to said Andrews, and being the same land conveyed to said Norman C. Baldwin by said Paige by said deed above mentioned, dated January 10th, 1873, and recorded in volume 82 of Deeds, at pages 115 to 118; also thirty-five (35) feet in width off of the north end of that part of the west half ($\frac{1}{2}$) of the southwest quarter ($\frac{1}{4}$) of section No. twenty-six (26), in town. No. 9 south of range No. seven (7) east, in the county of Lucas and State of Ohio, which is marked
231 on the Marston map of the city of Toledo Mrs. J. R. St. John, and more particularly described as follows: Commencing at a point on the north line of said half quarter section one hundred and sixty-three & $\frac{80}{100}$ feet east of the northwest corner thereof, thence east on the north line of said half quarter section three hundred and twenty-seven and $\frac{59}{100}$ feet (327.59); thence south thirty-five (35) feet; thence west parallel with the north line of said half quarter section three hundred and twenty-seven and $\frac{59}{100}$ (327.59) feet; thence north thirty-five (35) feet to the place of beginning, being the same land conveyed to said Norman C. Baldwin by James A. Corbusier and others by deed dated October 30th, 1875, and recorded in volume 93 of Deeds, at pages 134 and 135 thereof, in the records of said Lucas county, Ohio; also that part of the north half ($\frac{1}{2}$) of the south half ($\frac{1}{2}$) of the northeast quarter ($\frac{1}{4}$) of section No. twenty-

seven (27), in town. number nine (9) south of range number seven (7) east, in Lucas county, Ohio, described as follows: Commencing at a hub at the intersection of the line running between the land formerly owned by the heirs of the late Major C. Keeler and land lately owned by W. C. Earl with the section line between sections twenty-six (26) and twenty-seven (27), thence running westerly in the direction of the first-mentioned line (viz., along the south line of the north half of the south half of northeast quarter of section 27) to the center line of the United States turnpike; thence northeasterly along the center of said turnpike to its intersection with the section line between sections 26 and 27; thence south along said section line to the place of beginning, being that triangular piece of land lying west of said land formerly owned by W. C. Earl and between it and the United States turnpike, and being the same land conveyed by Alexander Henderson and wife to said Joseph Paige February 6th, 1873, and conveyed by said Paige to said Norman C. Baldwin by deed dated February 7th, 1873, and duly recorded in the records of deeds of said Lucas county, Ohio, but excepting and reserving from and out of the premises hereinbefore described the following-described parcels of land heretofore sold and conveyed by said Norman C. Baldwin as trustee, to wit: Lots Nos. eighty-two (82) and eighty-three (83), in the Robinwood Addition (extension), in the city of Toledo, Lucas county, Ohio, being the same land conveyed by Norman C. Baldwin to Joseph Paige by deed dated May 3d, 1878, and recorded in volume 102 of Deeds, at page 632 thereof, in the records of said Lucas county, Ohio; also that part of the northwest quarter (¼) of section 26, in town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point on the west line of Collingwood avenue or Territorial road, so called, ninety-eight (98) feet north of the east and west center line of said section 26, thence west at right angles to said road two hundred and twenty-five (225) feet; thence north parallel with said west line of said road sixty-five (65) feet; thence east parallel with said first line two hundred and twenty-five (225) feet; thence south to the place of beginning, being the same land conveyed by Norman C. Baldwin to George G. Keeler by deed dated June 1st, 1873, and recorded in volume 75 of Deeds, at page 513, in the records of said Lucas county, Ohio; also that part of the southwest quarter (¼) of said section number 26, town. 9 south of range seven (7) east, in Lucas county, Ohio, described as follows: Beginning at a point three hundred and fifty (350) feet west of the west line of Collingwood avenue and sixty-eight (68) feet south of the east and west center line of said section No. 26, thence west one hundred (100) feet parallel with said east and west centre line; thence south two hundred and twenty-four (224) feet parallel with said west line of Collingwood avenue; thence east one hundred (100) feet parallel with said east and west center line; thence north two hundred and twenty-four (224) feet to the place of beginning, being the same land conveyed by N. C. Baldwin to Amelia Schiely by deed dated May 15th 1873, and recorded in volume 75 of Deeds, at page 598, of the rec-

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ords of said Lucas county, Ohio; also that part of the southwest quarter (¼) of said section 26, town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point four hundred and fifty (450) feet west of the west line of Collingwood avenue and sixty-eight (68) feet south of the east and west centre line of said section 26, thence west one hundred (100) feet parallel with said east and west centre line; thence south to the north line of land of Louis Wenz parallel with the west line of Collingwood avenue; thence east one hundred (100) feet parallel with said east and west centre line; thence north to the place of beginning, being the same land conveyed by Norman C. Baldwin to Nancy M. Coon by deed dated June 27th, 1873, and recorded in volume 77 of Deeds, at page 504 thereof, in the records of deeds of said Lucas county, Ohio; also that part of the southwest quarter of said section 26, town. 9 south of range 7 east, in Lucas county, Ohio, described as follows: Commencing at a point two hundred and fifty (250) feet west of Collingwood avenue and sixty-eight (68) feet
233 south of the east and west centre line of said section No. 26, thence west one hundred (100) feet parallel with said east and west centre line; thence south two hundred and twenty-four (224) feet parallel with said west line of Collingwood avenue; thence east one hundred (100) feet parallel with said east and west center line; thence north to the place of beginning, being the same land conveyed by said Norman C. Baldwin to Joseph Paige by deed dated about February 20th, 1879, and duly recorded in the records of Lucas county, Ohio, be the premises hereby conveyed more or less, but subject to all legal highways; to have and to hold an undivided three-eighths (⅜) interest in and to all and singular the above mentioned and described premises, together with all the hereditaments and appurtenances thereunto belonging, with the exceptions above named, unto the said party of the second party, his heirs and assigns forever.

In witness whereof the said parties of the first part have hereunto set their hands and seals the day and year first above written.

THOMAS C. ST. JOHN. [SEAL.]
LUCINDA ST. JOHN. [SEAL.]

Sealed and delivered in the presence of—
MRS. FRED. STORM.
FRANK J. JEROME.

STATE OF OHIO, }
Lake County. }

On this 27th day of September, A. D. 1884, before me, a notary public, of said county, personally appeared the above-named Thomas C. St. John and Lucinda St. John, his wife, and acknowledged, individually and severally, that they did sign and seal the foregoing instrument, and that the same is their free act and deed. I further certify that I did separately and apart from her husband examine the said Lucinda St. John and made known to her the contents of the above instrument, and on that examination she declared that

she did voluntarily sign, seal, and acknowledge said instrument and that she was still satisfied therewith.

In witness whereof I hereunto set my hand and official seal this 27th day of September, 1884.

FRANK J. JEROME, [SEAL.]
Notary Public.

Transferred Sept. 29th, 1884.

WALTER PICKENS, *Aud.*
STEIN.

Received for record Sept. 29th, 1884, at 4.30 p. m.
Recorded Oct. 3d, 1884.

CHAS. J. KIRSCHNER, *Recorder.*

234 I, Wm. V. McMaken, recorder of Lucas Co., Ohio, do hereby certify that the within and foregoing is a true and correct copy of a certain quitclaim deed executed by Thomas C. St. John and wife to Wallace C. Andrews, bearing date of Sept. 18th, A. D. 1884, and duly recorded in my office Sept. 29th, A. D. 1884, at 4.30 p. m., in vol. 132 of Deeds, page 41, &c.

Witness my hand and official seal this 23d day of Oct., A. D. 1889.

[SEAL.] WM. V. McMAKEN,
Recorder Lucas Co., Ohio.

[Endorsed:] Certified copy of quitclaim deed from Thomas C. St. John & wf. to Horace C. Andrews. Lucas Co., recorder's office. Transferred Sept. 29, 1884. Walter Pickens, auditor. Stein. Received for record Sept. 29th, 1884, at 4.30 p. m. Recorded in vol. 132 of Deeds, page 41, Oct. 3d, 1884. Chas. J. Kirschner, recorder.

235 EXHIBIT No. 7. Oct. 25, 1889. E. H. Smith, Stenographer.

I, Augustus Schell, of the city of New York, revoke all wills heretofore made and make and declare this to be my last will and testament.

First. I give and bequeath to my wife, Anna Schell, two hundred thousand dollars, which amount I authorize her to take in cash or in such railroad bonds at their par value or in such stocks at their market value as she may select out of the bonds or stocks of which I may die possessed, excepting, however, those stocks which are herein specifically disposed of, and said sum shall be paid as soon as practicable after my decease and shall draw interest from my death if taken in cash, and if taken in bonds or stocks she shall be entitled to the interest or dividends accrued thereon at the time of my death.

Second. I give and bequeath to the Union Trust Company of the City of New York one thousand shares of the capital stock of the New York Central and Hudson River Railroad Co., one thousand shares of the capital stock of the Union Pacific Railroad Company, and one thousand shares of the preferred stock of the Chicago and Northwest Railroad Company, in trust, to collect and apply the in-

come thereof to the use of my said wife during her life, and at her death the same shall form and be disposed of as a part of my residuary estate.

Third. I also give to my said wife all the furniture, household articles, silver-plated and glassware contained in my house No. nine West Thirty-fourth street, in the city of New York, and the horses, carriages, harness, and other articles owned by me and in my stable, No. sixteen West Thirty-fifth street, in said city.

Fourth. I give, devise, & bequeath unto my said wife, for and during her life, the house, stable, and grounds, No. 9 West Thirty-fourth street, and Nos. fourteen and sixteen West Thirty-fifth street, in said city, and at her death the same, unless sold, shall form part of my residuary estate & be disposed of as such.

Fifth. I authorize and empower my executors hereinafter named, or the survivors or survivor of them, by and with the consent of my said wife, to sell and convey the said premises mentioned in the preceding article or any part thereof as hereinafter provided, and the proceeds of such sale shall be received and held by them in trust, to apply the income thereof to the benefit of my said wife during her life, and at her death the said proceeds shall form and be disposed of as part of my residuary estate. It is my will that the provisions herein made for my said wife shall be in lieu of dower and of all claim on my estate.

236 Sixth. If I survive my said wife, then I give to her nephew, Austin G. Fox, and her niece, Rebecca F. Riggs, all the jewelry, laces, wardrobe, and wearing apparel which belonged to my wife, and all the table and bed linen and small silverware owned by us; and I give to the said Austin & Rebecca the residue of said small silver and all the personal estate which I may have received from my said wife and standing in her name, to be divided equally between them.

Seventh. I give to my brothers, Robert Schell and Edward Schell, each the sum of four hundred thousand dollars, and to the children of my sister, Emily Fellows, viz., James W. Fellows, Richard C. Fellows, Julia Coddington, and Mary Hoyt, each the sum of one hundred thousand dollars; and I give to my executors hereinafter named the sum of fifty thousand dollars in trust, to apply the income thereof to the benefit of the child of my deceased nephew, Robert Fellows, during its life, and on its death to pay over the same to its lawful issue, if any; and if there be none, then to retain the said sum and apply the income thereof to the benefit of the widow
J. E. B. of the said Robert Fellows during her life, and in case of the
J. E. B. death of said widow, then the said sum shall form and be disposed of as part of my residuary estate.

Eighth. I give to Helen, the widow of my deceased brother, Richard Schell, the sum of fifty thousand dollars, and I release her from an indebtedness to me of seven thousand dollars or thereabouts.

Ninth. I give to Augustus Schell Hutchins, son of my friend, Waldo Hutchins, my watch and the sum of ten thousand dollars, and to my cousin, Jane Ann Gillender, Caroline Schell, William R. Schell, and Abigail Baker each the sum of five thousand dollars;

and to the New York Historical Society, the New York University, the New York Institution for the Blind, and the New York Eye & Ear Infirmary each five thousand dollars.

Tenth. I release my brother Robert from all indebtedness to me, except in regard to one hundred shares of the capital stock of the Bank of the Metropolis; and I release my brother Edward from all indebtedness & obligations to me, except in regard to two hundred and fifty shares of the Metropolitan Gas Light Company stock, and fifty Oregon Short Line bonds, in respect to which they must respectively account to my estate.

Eleventh. All the rest and residue of my estate, real and personal, I give, devise, and bequeath as follows: One-third thereof to the children of my deceased sister, Emily Fellows, the children of my brother, Edward Schell, & the child of my brother, Robert
237 Schell, to be divided between them in equal portions: Provided, however, that the portion to which the child of my deceased nephew, Robert Fellows, may be entitled hereunder shall be received and held and invested by my executors in trust, to apply the income thereof to the benefit of said child during its life and after its death to pay over the principal to its lawful issue, if any, and if there be none to divide the same between the then surviving children of my said brothers (Robert & Edward) and of my said sister, Emily Fellows, in equal portions the issue of any who may have deceased to take the share of the parent. One other third of such residue I give, devise, & bequeath to my executors, hereinafter named, in trust to apply the income thereof to the use of my brother, Robert Schell, during his life, and after his death to divide the same in equal shares or portions among the children of my brother Edward, the child of my brother Robert, and the following children of my sister, Emily Fellows, viz., James W. Fellows, Richard C. Fellows, Julia Coddington, and Mary Hoyt; one other third of such residue I give, devise, and bequeath to my executors, hereinafter named, in trust to apply the income thereof to the benefit of my brother Edward during his life, and at his death to divide the same in equal shares or portions among the children of my brother Edward, the child of my brother Robert, and the four above-named children of my sister Emily Fellows. It is my will that the residue hereby given shall include all lapsed legacies and all legacies which for any reason shall not take effect, and that the children of my deceased niece, Catharine Elizabeth Cragen, shall take the share which she would have taken, if living, in any part of my estate as one of the children of my brother Edward, and that in case any of my now living nephews or nieces heretofore mentioned shall die leaving lawful issue such issue shall take the share which the parent would have, if living, under this will, but that the child of my deceased nephew, Robert Fellows, shall not take any share of my estate, except that specially given by the seventh article of this will (and the share of the third of the residue of my estate specified in the first clause of the eleventh article hereof).

Twelfth. It is my will that the provisions herein made for the

benefit of my wife shall be first satisfied before the payment of any other sum hereunder.

Thirteenth. I authorize and empower my executors or the survivors or survivor of them to sell and dispose of all real estate of which I may die seized, either at public or private sale and
238 on such terms as they may think proper, and on such sale to make, execute, and deliver good and sufficient deed of conveyance to the purchasers thereof; but this shall not apply to the real estate given to my wife for life, except it be sold with her consent, as hereinbefore provided.

Fourteenth. I authorize & empower my executors and the trustees hereby created to invest all moneys hereby directed to be invested by them respectively in such securities as they may deem proper, and that they shall not be limited to such mode of investment or to such securities as trustees are by law limited.

Fifteenth. I appoint my brothers, Robert Schell and Edward Schell, and my nephew, James W. Fellows, executors of this my last will and testament.

AUGUST. SCHELL. [L. S.]

Dated New York, March 9th, 1884.

Signed, sealed, published, and declared by the said Augustus Schell as his last will and testament in the presence of us and of each of us, who, at his request, in his presence and in the presence of each other, have hereunto subscribed our names as witnesses.

The word "nephew," on 12th line, 6th page, interlined before execution; the words "if unmarried" and the words "or remarriage," on the 6th and 5th lines from foot of page 3, erased before execution.

J. E. BURRILL,
No. 9 East 56th St., New York city.
WILLIAM V. BURRILL,
No. 9 East 56th St., New York city.
JAMES RICHMOND,
9 West 34 St., New York city.

Codicil, made this fourteenth day of March, one thousand eight hundred and eighty-four, to the last will and testament of Augustus Schell, made and dated the ninth day of March, one thousand eight hundred and eighty-four.

I revoke the clause of my said will giving to the child of my deceased nephew, Robert Fellows, an interest in the residue of my estate, and I revoke all previous gifts or devises to or in favor of said child except the gift of fifty thousand dollars mentioned in the seventh article of my said will, and declare that said child shall not under my will take or have any other interest in my estate than that given by said last-mentioned article, and, except as hereby modified, I reaffirm my said will. Dated and sealed by the said Augustus Schell this fourteenth day of March, one thousand eight hundred and eighty-four.

AUGUSTUS SCHELL. [L. S.]

239 Signed, sealed, published, and declared by the said testator, as and for a codicil to his last will and testament, in our presence, who, at his request and in his presence and in the presence of each other, doth hereunto subscribe our names as witnesses.

J. E. BURRILL,
9 East 56th St., New York.
WM. V. BURRILL,
9 East 56th St., New York.
JAMES RICHMOND,
9 West 34th St., New York.

Codicil, made this eighteenth day of March, A. D. 1884, to the last will and testament of Augustus Schell, made the ninth day of March, 1884.

First. In addition to the three thousand shares of stock mentioned in the second clause of my said will, I give and bequeath to the trustee therein named one thousand shares of the stock of the New York and Harlem Railroad Company, to be held and applied and disposed of as in the said second clause of my will directed.

Second. I modify the fifth article of my said will so that the proceeds of the real estate therein mentioned, if sold during the life of my wife, shall be paid by my executors to the Union Trust Company of New York, and I give the said proceeds to said trust company in trust to apply the same to the benefit of my said wife, as therein directed, and, after the death of my said wife, the said proceeds shall be disposed of as in said fifth article of said will provided, the only modification of said fifth article intended being to make the said trust company the trustee for my wife instead of the executors, as therein provided.

Third. As modified by this codicil and the codicil made the fourteenth day of March, I reaffirm my said will.

Dated and sealed this eighteenth day of March, 1884.

AUGUSTUS SCHELL. [L. S.]

Signed, sealed, published, and declared by the suid testator, Augustus Schell, as and for a second codicil to his last will, dated fourteenth March, 1884, in the presence of us and of each of us, who, at his request and in his presence and in the presence of each other, have hereunto subscribed our names as witnesses.

J. E. BURRILL,
9 East 56th St., New York.
JAMES RICHMOND,
9 West 34 St., New York.

240 STATE OF NEW YORK, } ss:
City and County of New York, }

I, James F. McLaughlin, clerk of the surrogate's court of said county, do hereby certify that I have compared the foregoing copy of the last will and testament of Augustus Schell, deceased, with the original record thereof now remaining in this office, and have found

the same to be a correct transcript thereform and of the whole of such original record.

In testimony whereof I have hereunto set my hand and affixed the seal of the surrogate's court this 26th day — October, in the year of our Lord one thousand eight hundred and eighty-nine.

JAMES F. McLAUGHLIN,
Clerk of the Surrogate's Court.

241 In the United States Circuit Court, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Plaintiffs,
vs.
WM. T. WALKER *et al.*, Defendants. } No. 922.

Notice to Take Depositions.

The defendants will take notice that on Saturday, the 30th day of November, A. D. 1889, the above-named plaintiffs will take depositions of sundry witnesses, to be used as evidence on the trial of the above-entitled cause, at the office of the Hotel Anderson, in the city of Pittsburgh, county of ——, State of Pennsylvania, between the hours of 9 o'clock a. m. and 6 o'clock p. m.

DOYLE, SCOTT & LEWIS,
E. D. POTTER, JR.,
Attorneys for Pl'ff.

I acknowledge service of the above notice of copy this 27th day of November, 1889.

CLARENCE BROWN,
Attorney for Def'ts.

242 Afterwards, to wit, on the 5th day of December, A. D. 1889, the following depositions were filed in the clerk's office, to wit:

In the Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER *et al.*, Defendants.

Depositions taken before me, William K. Gray, a notary public within and for the county of Allegheny and State of Pennsylvania, pursuant to the annexed notice, at the time and place therein specified, to be read in evidence on behalf of the plaintiffs in an action pending in the circuit court of the United States, northern district of Ohio, western division, in which James W. Fellows *et al.* are complainants and William T. Walker *et al.* are defendants.

Present: A. W. Scott, Esq., on behalf of complainants, and W. H. Read, on behalf of defendants.

J. B. BLACK, of lawful age, being duly sworn, testifies as follows:

Direct examination by Mr. A. A. SCOTT:

1 Q. State your name, age, residence, and occupation.

Ans. J. B. Black; age, forty; residence, Butler, Pa.; occupation, oil contractor and oil producer.

2 Q. What experience have you had in boring for natural gas?

243 Ans. I have had twenty-five years' experience drilling oil, and have been drilling gas wells almost exclusively for the last six years.

3 Q. Before you drilled for gas what were you drilling?

Ans. Oil.

4 Q. Give as nearly as you can the number of gas wells you have drilled within the last six years.

Ans. Twenty-five wells, anyway, of gas.

5 Q. In what gas field has this boring been done?

Ans. In Westmoreland county and Washington county, Pa.

6 Q. I wish you would give your experience as to the durability of gas wells under continuous flow.

Objected to; not in rebuttal.

6 Ans. Well, I don't know hardly how to answer that question.

7 Q. I will ask you whether your experience has taught you whether gas wells under a continual exhaustion finally reach a certain pressure and a certain flow which cannot be diminished by a continued draft thereafter.

Question objected to; not in rebuttal.

7 Ans. Well, I have drilled a good many gas wells that are completely exhausted now that were good wells when I drilled them.

8 Q. The question was, in addition to this, whether, having a certain pressure when they were first opened, under exhaustion did the pressure lessen down to a certain point, which might be called its "flowing capacity," and then not decrease under continued exhaustion.

Question objected to; not in rebuttal.

8 Ans. Well, the rock pressure continues to go down until it finally exhausts. The water comes in and takes the place of the gas and the gas ceases to flow.

9 Q. Did you ever know of what is called a "continued
244 flowing capacity" of a gas well that was virtually inexhaustible?

Question objected to; not in rebuttal.

9 Ans. I never did.

10 Q. Do you know anything of the Washington natural-gas field?

Ans. No; I don't know much about it.

11 Q. Have you had any experience in what is known as the Washington County gas field?

Ans. Well, I drilled several wells in what is known as the Hickory gas field, in Washington county.

12 Q. Is that in Washington county?

Ans. Yes, sir.

13 Q. Are you familiar with a line from the Hickory field to Pittsburgh gas line?

Ans. I know there is one from there.

14 Q. Did you ever hear that called the Washington line?

Ans. Yes, sir.

15 Q. Do you know when this line was constructed?

Ans. I think about three years ago.

16 Q. I will ask you whether, in your experience in boring for gas, if you find that under a continuous draft a field will be reduced down to about what is called a "flowing capacity," and then that capacity would be maintained under continued draft thereafter.

Question objected to; not in rebuttal.

16 Ans. I never knew of such a field.

17 Q. I will ask whether water has been found, in your experience in drilling for gas, in what is known as the gas sand.

Question objected to; not in rebuttal.

17 Ans. Yes, sir; in places I have found water and no gas at all in the same sand that produces the gas.

18 Q. Is this unusual or a common state of affairs?

Ans. Well, in Murrysville field, along the edge of the gas belt, I drilled three wells, all of which had had water, but a very little gas.

245 19 Q. Is that what is called "salt water" or what do you call it?

Ans. They generally call it salt water, but it is more of a soda water.

20 Q. But it is what in general parlance is termed "salt water?"

Ans. Yes, sir.

21 Q. Did you find salt water in the gas sand in other localities that you drilled in beside the one mentioned?

Question objected to; not in rebuttal.

21 Ans. Yes I have drilled wells in Allegheny county, Pa., near McKeesport. We got water with the gas in the same sand that is called the Murrysville gas sand.

22 Q. When the gas is exhausted what is the usual result that follows it?

Question objected to; not in rebuttal.

22 Ans. The water follows the gas.

23 Q. Is that the universal rule?

Question objected to; not in rebuttal.

23 Ans. It has been my experience.

Cross-examination by Mr. READ:

24 Q. I will ask you what gas companies you have drilled for?
24 Ans. For the Carpenter Gas Co., for the Wheeling Gas Co., the Chartiers Valley Gas Co., and have also drilled for the National Tubes Works Co.
25 Q. In what business are you now engaged and with whom?
Ans. I am only drilling one well now.
26 Q. For whom is that being drilled?
Ans. For James Cochrane, Sons & Co.
27 Q. A private company?
Ans. Yes.
28 Q. Where are you drilling the well?
Ans. We are drilling it at Dawson, Pa.
246 29 Q. Where does your line run?
Ans. We have no line at all.
30 Q. How far from Pittsburgh is it?
Ans. It is in Fayette county; I suppose fifty or sixty miles.
31 Q. Where do they propose to pipe the gas?
Ans. They are using it at Dawson.
32 Q. Are there manufacturing companies there?
Ans. No, sir.
33 Q. Do they propose to use the gas for supplying the town of Dawson or assisting to?
Ans. Yes, sir.
34 Q. How long since you were engaged in the Chartiers Company?
Ans. I have not drilled any wells for them for about two years.
35 Q. For these five companies that you mention, for whom did you drill the last wells and how long since?
Ans. Last well we drilled for Versalles Company. I think I finished the last one in August.
36 Q. How many wells did you drill for the Versalles Company?
Ans. Four.
37 Q. Within what length of time?
Ans. In the last two years.
38 Q. What contracts have you now for drilling of wells?
Ans. None but the one I spoke to you about at Dawson.

247 Also personally appeared A. EARSEMAN, who, being duly sworn, testifies as follows:

1 Q. What is your name, age, residence, and occupation?
Ans. A. Earseman; age, forty-eight; residence, Oil City, Pa.; occupation, general sup't Anchor Oil Company.
2 Q. What experience have you had in drilling for natural gas?
Ans. I have been in the country for the last twenty-five years, and *for* four or five years ago I came down here and drilled for J. M. Guffey & Company, and drilled several wells in Washington county —drilled two at Murrysville; drilled two down on the Beaver river, above there.
3 Q. I will ask you what your experience in drilling — natural gas

has taught you, as to whether or not there is what may be called a "flowing capacity" for a gas well—that is to say, that when a gas well is first opened, under continual draught the pressure will reduce to a fixed capacity, called a flowing capacity, and that then, under continual draught, no diminution of supply or pressure will be noticed.

Question objected to; not in rebuttal.

3 Ans. It will exhaust until there is nothing left. Water will take its place.

4 Q. Did you ever hear in this locality of the "flowing capacity" of a well that remained permanent?

Question objected to; not in rebuttal.

4 Ans. No, sir.

5 Q. How many gas wells are you familiar with in what is known as the Pittsburgh district?

Ans. Well, I might say all of them, in the known fields.

6 Q. Have you bored for gas in all of the known fields in
248 and about Pittsburgh?

Ans. No; but I have been there when they were bored.

7 Q. Do you know any variation from the rules that you have spoken of as to the ultimate exhaustion of wells under continuous draught?

Question objected to; not in rebuttal; also leading.

7 Ans. No, sir.

8 Q. Did you ever hear or know of getting salt water in what is known as the gas sand?

Question objected to; not in rebuttal.

8 Ans. Yes, sir.

9 Q. You may state, as fully as you can, your experience under that particular circumstance.

Question objected to; not in rebuttal.

9 Ans. Now, we will take the Murrysville field, which is the largest gas field that is found and the strongest. It is of dome shape; the rocks dip in all directions. Now, on the south side J. M. Guffey & Co. drilled a well and we got water in the Murrysville sand. It flowed, I should say, about two or three thousand barrels a day. About a mile west of that, at Wall station on the P. R. R., the railroad company drilled to furnish water for their locomotives. Then, a mile east of that, the Carpenter Gas Company drilled a well. All these wells were water in the Murrysville sand. Then, on levelling up the strata toward Murrysville, we found that they were of rock of one twenty (something omitted—not in notes), for we went up as near as we could go to the top of the strata and drilled a well, and it was the largest gas well in the Murrysville field. In less than a year that well was watered out and abandoned. The three wells down on the slope quit flowing water, and it showed that it took

the pressure off the crown of the dome. The water was
249 flowing up. Now, it is only a matter of the time until the water will go all over the dome. That is the fate of all gas wells I know of in the country. If you take the gas out of the wells something must take its place. Now, in the oil country you will find that the gas has the top, the oil next, and the water last. You take the gas and the oil will come; then take the oil and the water will come. That is where the oil lays, adjoining the gas, but in Murrysville oil laid adjoining the gas; no water there; but where in the Washington field the oil lays adjoining the gas there, and where you find an oil field adjoining it it destroys the gas. You take the oil out the gas has to go with it. At Cherry Grove, in Warren county, at Clarion, they had two large gas wells in what is called the Chipley Santde. Mr. Dimick, Capt. Grace went nine miles away and bored up what is known as the Cherry Grove field. When we had three hundred oil wells producing there, or less, we destroyed these gas wells nine miles away, while at Clarendon the sand was full of gas wells. They were both in the same place sand rock, and wherever most wells were drilled out the pressure — out.

10 Q. Is it true, then, that after you strike the gas and get the gas that water or oil follows it up?

Question objected to; not in rebuttal.

10 Ans. Now, I will give you an instance of it. In the Broadford field, McCain county, on the edge of the oil belt, is a very large gas well, and in three years that was an oil well. The gas had exhausted and the oil had gone into the well and produced an oil well, and that is one of our points, in following the oil back, and the gas will even burn with a black smoke; we can say there is oil or water by following down on the slope.

Cross-examination by Mr. READ:

1 Q. You are now engaged with a gas company?
Ans. Yes, sir.
250 2 Q. How long have you been there?
Ans. I have been with them four years.
3 Q. How long has it been since you went to work for them?
Ans. I went to work for them in 1883.
4 Q. Where is their headquarters?
Ans. In Oil City, and the main office in New York city.
5 Q. Who are their principal officers?
Ans. The president is L. H. Smith.
6 Q. Where does he reside?
Ans. New York.
7 Q. Who is the treasurer?
Ans. S. Comfort is treasurer.
8 Q. Who are the board of directors?
Ans. I don't know. These are the only two parties I have anything to do with.
9 Q. Do you know any of the board of directors?

Ans. Yes, sir. Capt. J. J. Vandegrift and H. Pickering, of Titusville.

10 Q. Who else?

Ans. I think there is a man by the name of Chambers, from Newton, Pa. The others I do not know.

11 Q. Can you give me the names of some of the stockholders?

Ans. I cannot. That is something that is outside.

12 Q. Who requested you to come to testify in this case?

Ans. Mr. Boyle.

13 Q. When?

Ans. I got a telegram from him yesterday.

14 Q. Where was the telegram sent from?

Ans. I don't know.

15 Q. How long have you known Mr. Boyle?

Ans. About eight years.

16 Q. Do you know what business he is engaged in?

Ans. I understand that he is connected with the Toledo Commercial.

17 Q. When did you meet him?

Ans. This morning at breakfast.

18 —. He wired you to come from Oil City, then, and you came in response to his request?

Ans. Yes, sir.

251 Personally appeared ROBERT A. GALEY, who, being duly sworn, *and* testified on behalf of the plaintiffs as follows:

Direct examination by Mr. SCOTT:

1 Q. What is your name, age, residence, and occupation?

Ans. Robert Galey; Rochester, Pa.; age, forty-five; occupation (not given).

2 Q. What experience, if any, have you had in drilling for natural gas?

Ans. Well, I have been in the business over five years. I had charge of the gas business in 1875 for the Bridgewater Gas Company.

3 Q. Has your experience been constantly in the gas field for the past five years?

Ans. Yes, sir.

4 Q. From that experience I would ask you whether you have discovered that a gas well has what is termed a "flowing capacity." What I mean is that when a gas well is opened it will show a certain capacity, which under continued draught may be diminished, but that it will undoubtedly reach what might be called a flowing capacity from which continued draught will make no diminution.

Question objected to; not in rebuttal.

5 Ans. My experience has been that when the gas first comes it is generally pretty strong, and afterwards it becomes exhausted. We have had wells in the Sheffield field that were strong wells, and in three years they were flowed out and abandoned.

6 Q. By this "flowing capacity" what do you know of that? I mean a flowing capacity that will remain permanent under continued draught.

Question objected to; not in rebuttal.

6 Ans. Well, a well has got a flow of gas, but as they draw on it from the tank it becomes exhausted, being played out and abandoned after being played out.

7 Q. Did you ever hear of the term "flowing capacity" of the well here?

252 Question objected to; not in rebuttal.

7 Ans. We take a well by the pressure. We gauge them each month, as a general thing, and we know pretty nearly how much the pressure diminishes in a month, and we have found that they will drop a pound every day.

8 Q. Do you know any exception to the rule you have just stated as to the ultimate exhaustion of wells?

Question objected to; not in rebuttal.

8 Ans. It depends a good deal on how much you draw on it from the different lines. The more the field is drawn on the quicker it exhausts.

9 Q. Did you ever hear or know of getting salt water in the gas sand?

Question objected to; not in rebuttal.

9 Ans. It is not salt water. I would call it a kind of a mineral water. In all cases there is water in the gas-bearing wells.

10 Q. In common language don't they call it salt water?

Ans. They call it salt water; yes; that is what they call it.

11 Q. You can give your experience to this.

Question objected to; not in rebuttal.

11 Ans. We found water in all our wells, and when the well plays out the water comes in.

12 Q Do I understand you that the water comes in the same place that the gas leaves?

Ans. We have to blow our wells off as they become old on account of the water being in the rocks and coming into the wells.

13 Q. Does the water come into the wells, according to your opinion, from leakage through the casing or by coming through the gas rocks?

Question objected to; not in rebuttal.

253 13 Ans. I would say that it came in through the gas sand, because we have cased wells nearly to the gas sand.

14 Q. And what was the result of this?

Ans. The result was that they had the water in just the same as when we packed them.

15 Q. Is it true or not that after you struck gas and drew out the gas that water came in?

Question objected to; not in rebuttal.

15 Ans. As the pressure became weaker the gas diminished, and, as a general thing, the water takes its place. We have had some wells in Sheffield that have had no water in, but the majority of the wells were filled with water if the rock pressure became lower.

16 Q. Have you any knowledge of any gas lines that in this locality have been abandoned by reason of the exhaustion of the fields from which they drew their supply?

Question objected to; not in rebuttal.

16 Ans. I have had no experience only in the Sheffield district. That is the only experience I have had in the gas field practically.

17 Q. What is your experience as to the durability of gas?

Question objected to; not in rebuttal.

17 Ans. We had, for instance, a well. We struck it some time last spring, and I think it was the largest well I ever saw, and in six months we abandoned the well on account of water.

18 Q. Have you any knowledge of a gas line to Youngstown, Ohio, that has been abandoned by reason of the exhaustion of the territory from which it drew its supply?

Question objected to; not in rebuttal.

18 Ans. The line was taken up this last fall—a twelve-inch line to Youngtown—on account of shortage of gas.

254 Cross-examination by Mr. READ:

1 Q. How long have you been engaged by the gas company?
Ans. Five years.
2 Q. Where is their principal office?
Ans. Rochester, Pa.
3 Q. Who are its officers?
Ans. J. H. Hice, of Beaver, Pa., is president; Whitney or Stevenson, of Pittsburgh, secretary.
4 Q. Is it a local company?
Ans. It is a corporated Co.
5 Q. Who are its board of directors?
Ans. Mr. Hartman, of Beaver Falls; H. C. Fry, of Rochester, and I don't know the rest of the board.
6 Q. Who requested you to testify in this case?
Ans. Why, Mr. Boyle.
7 Q. What is Mr. Boyle's first name?
Ans. P. C. Boyle.
8 Q. Do you know that he is at present engaged as editor of the Toledo Commercial?
Ans. No; I don't.
9 Q. Have you heard so?
Ans. No, sir.
10 Q. How far from Rochester is Oil City?
Ans. I don't know exactly. By the railroad I think it is twenty-

five miles from here to Rochester, and they call it about one hundred and twenty-five miles from here.

11 Q. When did you see Mr. Boyle or when did Mr. Boyle see you?

Ans. I met him yesterday at the exchange, and he told me to come here this morning.

12 Q. At the oil exchange?

Ans. Yes, sir.

13 Q. Did you meet him there by appointment?

Ans. No, sir.

14 Q. When did you learn that he desired to have you testify here?

Ans. Mr. Boyle asked me to come here this morning.

15 Q. When did you first learn that Mr. Boyle desired you here this morning?

Ans. Yesterday.

16 Q. When did you first have any conversation with him
255 in regard to this meeting?

Ans. I did not have any until this morning.

17 Q. Still you say he asked you yesterday at the exchange to come here?

Ans. Yes, sir.

18 Q. Do I understand that the first thing you knew of what he wanted you for was when you came here this morning?

Ans. Yes, sir.

19 Q. You did not know what you were going to testify in regard to until within the last hour?

Ans. Yes, sir.

20 Q. When did you first see Mr. Scott—before or after you came back?

Ans. I did not see him until I came in the room this morning.

256 CHAS. T. FOWLER, being duly sworn on behalf of the plaintiffs, — as follows:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.

Ans. Chas. T. Fowler; age, thirty-four; residence, Freedom, Beaver county, Pa.; occupation, sup't of the Fort Pitt Natural Gas Co.

2 Q. You will please state what experience you have had in boring for gas and in what fields.

Ans. My experience has been in the north end of the Sheffield gas streak, known as the Baden gas field. Within the last fifteen months we have drilled eleven wells, some of which have a minute pressure of six hundred and fifty pounds.

3 Q. How long have you had experience with the gas fields in and about Pittsburgh?

Ans. Five years this fall.

4 Q. What portion of that field has your experience been confined to?

Ans. To Sheffield, Baden, Fairoaks, and Grafton.

5 Q. How many gas wells are you familiar with?

Ans. About fifty.

6 Q. Have you had any experience in drilling wells?

Ans. From fifteen to twenty wells.

7 Q. From the experience you have had in boring for natural gas I will ask you if you are familiar with the term "flowing capacity of a well." By that I mean after a continued draught for some time the original capacity of the well would be diminished to a fixed capacity called "flowing capacity," and that flowing capacity would continue under continual draught thereafter.

Question objected to; not in rebuttal.

7 Ans. I never saw a gas well connected to a gas line that would not exhaust itself in time—from one to four years.

257 8 Q. Do I then understand you to say that you know of no gas well which under continual draught will contain a fixed capacity?

Question objected —; not in rebuttal.

8 Ans. I wish to be understood that I never saw a gas well that putting forth a continual output of gas would not become exhausted.

9 Q. Can you give any particular wells in your past experience that would illustrate that?

Question objected to; not in rebuttal.

9 Ans. Yes, sir.

10 Q. You may do so.

Ans. Well number one on the Henry Werner farm, in Economy township, Beaver county, Pa., was completed on the first day of May, 1879, and had a minute pressure of 628 pounds, the well being two by four and a quarter tubing, rock pressure the same, and on the 14th day of October, 1889, the same well is entirely exhausted and filled up with salt water. The Bryan number one well on the Mrs. Anne Bryan farm, in the village of Baden, Beaver county, Pa., was drilled in November, 1885; had a minute pressure of 465 pounds; rock pressure, 680, and on the first day of October, 1889, it was abandoned. Mrs. Anne Bryan, number two, Baden, Beaver county, Pa., was drilled in May, 1886; pressure, 500 pounds a minute and four and a quarter tubing; rock pressure, 640 pounds; abandoned September, 1889; gas entirely exhausted. W. H. Moore, well number one, Baden, Beaver county, Pa., drilled in June, 1886; rock pressure, 240 pounds; four and one-quarter tubing; exhausted in May, 1886; abandoned. I know of half a dozen more. Pressure will vary at the striking of them.

258 11 Q. Did you ever know of a well which under continual draught would maintain its pressure for a month at a time?

Question objected to; not in rebuttal.

11 Ans. I never did. I don't believe there is a well that would continue the same pressure for thirty days under continual draught.

12 Q. When the gas is exhausted from the sand rock what usually takes its place?

Question objected to; not in rebuttal.

12 Ans. Salt water.

13 Q. Does this salt water, in your opinion, come from the rock itself or leak down the well from the top?

Question objected to; not in rebuttal.

13 Ans. My experience had been that as the gas pressure leaves the rock it is followed down with salt water in the rock itself.

14 Q. Is that your universal opinion or is it the exception?

Question objected to; not in rebuttal.

14 Ans. It has been my own experience. We have drilled wells two feet in the sand where we knew the sand to be forty feet thick, and we would put in our drill within six inches of the top of the sand, so that there could not be any*thing* possible chance for anything to get in except through the sand, and as the pressure would diminish the rock would fill up with salt water.

15 Q. In your experience in procuring natural gas have you ever known of territory being exhausted or lines of pipe for transferring gas being taken up by reason of the territory which it drained being exhausted?

Question objected to; not in rebuttal.

15 Ans. I know of the Bridgewater Gas Co. abandoning
259 their line from Sheffield gas field to Youngstown, Ohio, for shortage of gas.

16 Q. Did they have a supply at completion of boring?

Ans. They did. Our own company move our lines from field to field to supply our lines. We have recently had an expenditure of twenty-six thousand dollars moving our lines, for the reason that one line gave out and we had to get ourselves in position to get the other.

17 Q. Is that or is it not a common experience with gas companies?

Ans. It has been very general in Pennsylvania—Pittsburgh and vicinity.

Cross-examination by Mr. READ:

1 Q. How long have you been employed in this gas company?

1 Ans. Two years.

2 Q. Where is their headquarters?

Ans. At Pittsburgh; but we have stations at Freedom and Baden.

3 Q. Have they a New York office?

Ans. No, sir.

4 Q. Who is their directory?

Ans. Wm. G. Park, David Park, J. A. Rhode, Capt. J. J. Vandegrift, T. J. Vandegrift, B. W. Vandegrift.

5 Q. Who are their officers?

Ans. J. J. Vandegrift is president, W. G. Park is vice-president, and Jas. I. Buchanan secretary and treasurer.

6 Q. Who requested you to be present at this examination?

Ans. Mr. Boyle, or word was left at our office that Mr. Boyle wanted to see me yesterday. He came into the office this morning and asked me if I would come down to Hotel Anderson.

7 Q. Do you mean Mr. Patrick Boyle of Toledo?

Ans. I mean this gentleman. I never saw him before in my life.

260 Personally appeared GEORGE W. WOLFE, *as* being first duly sworn, testifies as follows:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.

Ans. Geo. W. Wolfe; I was born in 1840, on the twenty-seventh day of December, in Tarentum, Allegheny county, Pa.; my business is contractor and driller for oil and gas.

2 Q. How long have you been engaged in this business?

Ans. I went to Oil Creek —. (Rest of answer omitted.)

3 Q. Have you been engaged in it ever since?

Ans. I have never done anything else since I was over in Southern California—a year and a half—but I was in the oil field there.

4 Q. What experience have you had in drilling for gas?

Ans. In 1882 or 1883 I came to Tarentum to visit my home, and George Westinghouse wanted me to come and drill a gas well, and I have been there ever since—that is, round Tarentum and vicinity of Pittsburgh here.

5 Q. About how many gas wells have you drilled or are familiar with the drilling of?

Ans. Well, now, I don't know; upwards of one hundred, I suppose.

6 Q. From your experience in the drilling for natural gas I will ask you whether or not you have been made familiar with the term "flowing capacity" *of* a well maintained—a fixed supply that the well will furnish under a continual draught.

Question objected to; not in rebuttal.

6 Ans. There is no continued draught about it. When you first drill a gas well, when you strike the gas sand, you could catch hold of the cable and pull it back to the bull wheels, and they keep gradually going down, and we could drill for awhile, and then in
261 a month go down further, and that streak of sand would be exhausted entire; there would be not enough to blow off. Before we got to the fourth sand we would run against another streak of gas. It would go straight a round pressure to the minute, and the rock pressure we could not shut in; it would blow the casing out, and we would have to wait three or four days and then drill in deeper. These wells are all gone.

7 Q. Do you know of any exceptions to this rule, that a gas well from which you are taking gas all the time will undoubtedly get less and less—finally be exhausted?

Question objected to; not in rebuttal.

7 Ans. It is just the same as oil-boring. It is just a matter of time until the gas and oil both exhaust.

8 Q. When the gas is exhausted what, as a general rule, will take its place?

Question objected to; not in rebuttal.

8 Ans. Water—salt water.

9 Q. Does this salt water come in through the rock where we get the gas?

—. In the Westinghouse wells the salt water comes in with the gas; at Tarentum after the gas is exhausted the salt water came in in the same sand.

10 Q. Do you know Mr. Harmon F. Gettleman?

Ans. Yes, sir.

11 Q. How long since have you known him?

Ans. Well, now, I could not say — years. I could not say how many.

12 Q. Do you know whether he is a driller of gas wells or not?

Ans. Why, I could not say whether he is sup't or whether he drills them. I never inquired into his business. I merely know him when I see him.

Cross-examination by Mr. READ:

Q. 1. You state you are a driller and contractor.

Ans. Yes, sir.

262 Q. 2. How many wells have you on hand now?

Ans. Four; two in Virginia and two in Bakerstown.

Q. 3. For whom are you drilling these wells?

Ans. McAlum Oil Co. and Butcher Oil Co.

Q. 4. Do you know who are the officers of the McAlum Oil Co.?

Ans. Charles Kirk is the sup't.

—. Who is the president of the Co.?

Ans. David Kirk.

Q. 5. Who is the secretary?

Ans. Well, now, I don't know that.

Q. 6. Do you know who composes the board of directors?

Ans. I don't know. It is a very extensive company; seven or eight or nine hundred wells. Charley and his father David are the only ones I do business with, and they are old-time friends of mine.

Q. 7. Do you know any of the names of the directors of the company beside the Kirks?

Ans. Tack Bros. and Dilworth Bros., the coffee men.

Q. 8. Who else?

Ans. Farmer Deane—Isaac Deane.

Q. 9. Who else?

Ans. Well, now, I don't know. Dan. and John Shirley used to be in.

10 Q. You do not mean those men that you mention are directors, but that they are stockholders?

Ans. They are stockholders.

11 Q. Now, the Butchers' Oil Co. Do you know the directors?

Ans. Pat. Hoene is the president and the balance I don't know; it is twenty Dutch here in the market.

12 Q. They are the German of the market.

Ans. Twenty Dutch right here in the market.

13 Q. How long have you been drilling for the McAlum Oil Co.?

Ans. Since the bullion excitement.

14 Q. When was that?

Ans. In 1887.

15 —. Who requested you to come here to testify in this case?

Ans. Mr. Boyle. I met him yesterday at the restaurant.

16 Q. By appointment?

263 Ans. No, sir. I went in the restaurant and Mr. Boyle was talking to a gentleman, and I stepped up to him and he says to me, You have been drilling for gas up here. He says, I want you to come down to this house here and give your knowledge of gas wells.

17 Q. How long have you known Mr. Boyle?

Ans. I have known Mr. Boyle—how long is it—about seven or eight years.

—. Do you know where he is living at the present time?

Ans. No, sir.

19 Q. Do you know what business he is in?

Ans. No, sir.

20 Q. Do you not know that he is editing a paper in the city of Toledo?

Ans. No; I don't know his business. He was editor of the Oil City Derrick.

21 Q. How long *have* did he leave the Oil City Derrick?

Ans. I don't know. I don't know his business and don't know whether he is editor of a paper or not.

264 J. A. GARTLAND, being first duly sworn, testifies as follows:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.

Ans. John A. Gartland; age, forty-one; residence, Pittsburgh, Pa.; occupation, oil and gas well driller and contractor.

2 Q. What experience have you had in boring for natural gas?

Ans. Well, I have been engaged in drilling for oil and gas for twenty years; fifteen years since I started first to drill for gas.

3 Q. In what locality?

Ans. Within twenty-five miles of here.

4 Q. I will ask you what your experience has been with reference to the permanent supply of gas from wells under continual draught?

Question objected to; not in rebuttal.

Ans. Do you want me to state what I know about how long a well should last—the average of them or a fixed number?

5 Q. Well, the average of wells?

Ans. From one to four years is the life of a gas well.

6 Q. You don't understand me. I want you to testify as to whether or not a well will become exhausted under a continual draught from it—that is, if you continue to take gas from a well what will be the effect upon the well?

Question objected to; not in rebuttal.

6 Ans. It will become exhausted.

7 Q. Do you know of any exception to this rule?

Question objected to; not in rebuttal.

7 Ans. No, sir.

8 Q. When the gas is exhausted from the gas rock what, as a usual thing, takes its place?

Question objected to; not in rebuttal.

265 3 Ans. It would depend on the locality.

9 Q. Answer the question, then, with reference to different localities.

Question objected to; not in rebuttal.

9 Ans. In some localities there is nothing to take its place; others, salt water; in others, oil.

10 Q. Does this water and oil that takes the place of the gas come from the rock itself or from the well, either above or below the gas rock?

Question objected to; not in rebuttal.

10 Ans. The water takes the place of the gas or the oil takes the place of the gas in the rock. A gas well drilled in an oil well bearing sand may blow two or three years and there will be no oil well appear, but as the gas exhausts oil will take its place, and will become an oil well; as the pressure of the gas exhausts, the oil will come in and produce oil wells.

11 Q. Would the same rule apply where water comes?

Question objected to; not in rebuttal.

11 Ans. Water will eventually take the place of the gas. Gas wells have either salt water or oil, with very few exceptions.

Cross-examination by Mr. READ:

1 Q. How many wells have you now under contract, Mr. Gartland?

Ans. Eight.

2 Q. For whom are you drilling the wells?

Ans. For Murphy & Bonsell, Forest Oil Co.; Jas. Craig, Union Oil Co.

3 Q. Murphy & Bonsell, is that a private line?

Ans. They are individual operators.

4 Q. Where is their headquarters?

Ans. At Bradford and Philadelphia.

5 Q. The Forest Oil Co., where is its headquarters?
Ans. Pittsburgh, Pa.
266 6 Q. Who is its directory?
Ans. I don't know.
7 Q. Can you give me its officers?
Ans. I do business with W. J. Young.
8 Q. In what capacity does he act?
Ans. He lets the contracts.
9 Q. Do you know what position he occupies there?
Ans. I don't know whether he is president or manager.
10 Q. Do you know the names of any of the directors?
Ans. I do not, but I think Capt. Vandegrift is one of the directors. I am not positive.
11 Q. The Union Oil Co., do you know its directory?
Ans. I know but two—H. L. (did not get the name, but have Tolul) and Jno. Satterfield.
12 Q. Its headquarters is where?
Ans. At Buffalo.
13 Q. Mr. Gartland, who requested you to come here?
Ans. Mr. P. C. Boyle.
14 Q. When?
Ans. Yesterday.
15 Q. How long have you known Mr. Boyle?
Ans. Twelve years.
16 Q. Do you know what he is at present engaged in?
Ans. In the newspaper business.
17 Q. What newspaper?
Ans. I do not know the name of the paper, but understood he was connected with a newspaper in Toledo.

267 THOS. K. A. KING, of lawful age, being duly sworn, testifies as follows:

Direct examination by Mr. SCOTT:

1 Q. State your name, age, residence, and occupation.
Ans. Thos. K. A. King; age, forty-six; residence, Saxonburg, Butler county, Pa.; occupation, contractor and driller for oil and gas.
2 Q. How long have you been engaged in the business?
A. Since 1860.
3 Q. In what fields?
A. The fields in the vicinity of Pittsburgh.
4 Q. In what fields have you had most experience?
Ans. Oil creek, McCain county, and West Virginia.
5 Q. Have you had any experience in what is known as the Western Pennsylvania fields?
Ans. Yes, sir.
6 Q. Since what time?
Ans. 1872.
7 Q. From this experience I will ask you what is the effect upon a gas well which has a continual drawing of gas from it.

Question objected to; not in rebuttal.

7 Ans. It will become exhausted.

8 Q. I will ask you whether you have ever known of what might be called a "flowing capacity" of a well which remains permanent even under a continual draught.

Question objected to; not in rebuttal.

8 Ans. I never did.

9 Q. Did you ever hear of the term "flowing capacity" as applied to a gas well to indicate that it had a permanent capacity which would not be exhausted under a continual draught from it?

Question objected to; not in rebuttal.

268 9 Ans. I never did hear of any well but what would exhaust.

10 Q. After the gas is exhausted from the gas rock what usually takes its place?

Question objected to; not in rebuttal.

10 Ans. In some places salt water; in some places oil, and in other localities neither.

11 Q. What is the general rule with reference to this?

Question objected to; not in rebuttal.

11 Ans. In the majority of cases there is salt water comes.

Cross-examination by Mr. READ:

1 Q. How many wells have you under contract now?

Ans. Not contracting now.

2 Q. What business are you now engaged in at present?

Ans. With the Bridgewater Gas Co.

3 Q. Do you know who the president of the company is?

Ans. J. Hiese.

4 Q. How long have you been engaged with that company?

Ans. Since the fourth of September.

5 Q. What were you doing prior to your engagement with them?

Ans. Had charge of oil property in Washington county.

6 Q. Who requested you to come and testify here in this case?

Ans. Mr. Boyle; I met him on the street this morning about ten o'clock, and he asked me to come to the Hotel Anderson to see some parties.

269 STATE OF PENNSYLVANIA, } *ss:*
County of Allehgeny, City of Pittsburg, }

This is to certify that on the 30th day of November, A. D. 1889, between the hours of 9 a. m. and 4 p. m., at the Hotel Anderson, in said city, personally appeared the following-named persons, J. B. Black, A. Earseman, Rob't A. Galey, Chas. T. Fowler, Geo. W. Wolfe, J. A. Gartland, and Thos. K. A. King, who, being each duly sworn according to law, gave testimony in the case of Jas. W. Fellows *et al. vs.*

Wm. T. Walker *et al.*, which testimony was taken by stenographer and reduced to type by said stenographer.

In testimony whereof I have hereunto set my hand and notarial seal.

[Seal William K. Gray, Notary Public, Pittsburgh, Pa.]

WM. K. GRAY,
Notary Public.

270 STATE OF ——, ——— *County*, } *ss:*

JAMES W. FELLOWS *et al.*, Complainants, *vs.* WILLIAM T. WALKER *et al.*, Defendants. } Case No. 922, Pending in Circuit Court of United States, Northern District of Ohio, Western Division.

The above-named complainants will take notice that on Thursday, the 14th day of November, A. D. 1889, the defendants above named will take the depositions of sundry witnesses, to be used as evidence in the trial of the above cause, at the office of Brown & Geddes, No. 63 Produce Exchange building, in the city of Toledo, in the county of Lucas, in the State of Ohio, between the hours of nine o'clock a. m. and six o'clock p. m. of said day, and that the taking of the same will be adjourned from day to day between the same hours until they are completed.

G. W. KINNEY,
W. H. A. REED,
CLARENCE BROWN.
Attorneys for Defendants.

Service of the above notice is acknowledged, and proof of the official character of the officer before whom the said depositions may be taken is, by agreement, waived; also all exceptions as to time.

Done this 12 day of Nov., 1889.

E. D. POTTER,
DOYLE, SCOTT & LEWIS,
Attorneys for Comp'ts.

271 Afterwards, to wit, on the 7th day of December, A. D. 1889, the following depositions were filed in the clerk's office, to wit:

In the Circuit Court of the United States, Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER *et al.*, Defendants.

Depositions taken before me, Edward H. Smith, a notary public within and for the county of Lucas and State of Ohio, pursuant to the annexed notice, at the time and place therein specified, to be read in evidence on behalf of the defendants in an action pending in the circuit court of the United States, northern district of Ohio, western division, in which James W. Fellows *et al.* are complainants and William T. Walker *et al.* are defendants.

Present: A. W. Scott, Esq., on behalf of complainants, and Clarence Brown, Esq., on behalf of defendants.

WILLIAM T. WALKER, of lawful age, being by me first duly sworn as hereinafter certified, deposes and says as follows:

Direct examination by Mr. BROWN:

1 Q. State your name, age, residence, and occupation.

A. William T. Walker; age, sixty-four; residence, Toledo, Ohio; occupation, city auditor of the city of Toledo.

2 Q. You are the same person who has testified heretofore in this case?

A. Yes, sir.

3 Q. You may state if you are in possession of the official reports showing the cost of heating and lighting the different departments of the city of Toledo.

A. Yes, sir.

4 Q. Have you prepared and can you furnish a statement of the cost of lighting and heating the different city departments as shown by the city records in your office?

A. I have of the heating. I have not of the lighting. I have not heard anything about the lighting.

5 Q. Will you furnish to the notary that statement, make it a part of your deposition, and state what period it covers?

A. It is for the year 1888.

6 Q. Are the official reports for the year 1889 yet published?

A. No, sir.

7 Q. Please state the costs of heating the different departments as shown by the official reports for 1888.

272 A. It is as follows: The city pound department, $8; the board of elections, $8.05; police department, $471.86; fire department, $618.45; bridge department, $316.35; street department, $30.20; infirmary office, $43.32; Memorial building, $458.00, making a total of $1,954.23.

8 Q. Do you include the library?

A. No, sir.

9 Q. Can you furnish that?

A. Why, no, sir. In 1888 the public library did not do but about three months of business through the auditor's office, and consequently I cannot make that out. It is the same with all of the other departments.

10 Q. Did you give the general offices of the city?

A. They are all heated and paid in the rent.

Cross-examination by Mr. SCOTT:

1 Q. What is the fuel used in heating these buildings?

A. This last year it has pretty near all been natural gas.

2 Q. In the statement that you have given, then, it is natural gas?

A. Natural gas and coal, both—wherever coal was used and wherever natural gas.

3 Q. What proportion is gas and what coal?

A. A very large proportion is gas. The city pound is coal; the board of elections, part coal and part gas; the police department, pretty near all gas; I think that year the patrol barn was heated with coal; the fire department is pretty much all gas; the bridge department—I don't remember what proportion—I think largely of coal; the street department, coal; the infirmary office, part coal and part gas; the Memorial building, part coal and part gas, but nearly all gas.

4 Q. This gas was furnished by the present natural-gas companies here in Toledo?

A. Yes, sir.

5 Q. How does the cost of gas compare with the cost of coal?

A. I couldn't answer the question positively; but my impressions are, from the bills, that the gas is cheaper.

6 Q. You haven't with you the cost of coal when it was used exclusively as fuel in any year?

A. No, sir.

273 Also LUCIUS BROWN, of lawful age, being by me first duly sworn as hereinafter certified, deposes and says:

Direct examination by Mr. BROWN:

1 Q. State your name, age, place of residence, and occupation.

A. Lucius Brown; age, forty-six; residence, Toledo, Ohio; occupation, superintendent, secretary, and treasurer of the Toledo work-house.

2 Q. Is the Toledo work-house of which you speak one of the city institutions—one of the departments of the city government?

A. The work-house is built by the city and county. The county has an interest of seven thousand dollars, and the balance was built by the city, and the expense is borne in about that proportion by the city and the county—in proportion to the number of prisoners confined. It makes the cost fall larger upon the city than upon the county, because they have more cases. It is one of the public institutions of the city of Toledo, and our reports are made out to the

city council quarterly, and the bills are all paid through the auditor's office, the same as the other departments.

3 Q. Can you state the cost of heating and lighting the work-house for the period of one year past?

A. I can't give you the cost of lighting, because I was not asked for that. I understood you wanted the cost of fuel only. We use fuel there not only for heating, but largely in our business of manufacturing brick. In burning brick we use coal and wood both. For heating purposes we use coal and wood. I have made out a statement from my books up to the first of November of this year. Beginning with the first of January of this year—from January 1st to November 1st—I paid out for wood $1,651.40 and for coal $1,062.80.

4 Q. What would be the cost of fuel for the remaining months of the year 1889, if you know?

A. Taking the months of January and February and estimating it for the months of November and December, it would be $243. I will use yet this year for wood about $120; that is for kiln burning. My first item, $243, was for coal and $123 for wood to finish the year's business.

5 Q. Are the inmates required to carry on the work you have named there—the making of brick?

A. That is done entirely by our inmates. Yes, sir; the work.

6 Q. State whether natural gas is suitable and is, in fact, used for the purpose of burning brick.

A. Yes, sir; I think it is used in every yard in the city except ours.

Cross-examination by Mr. SCOTT:

1 Q. The fuel that you have spoken of—coal and wood—is used for the manufacture of brick in connection with the institution as well as for heating the building and doing the cooking?

A. Yes, sir; I have included everything for which fuel is used—heating the building and the laundry-work. Our heating is done by steam.

2 Q. Natural gas has not been used for fuel there at all?

A. No, sir; not for any purpose.

274 3 Q. Are these bills which you have rendered for the current year about the average price for fuel?

A. In our department the bills have increased a trifle over last year. We have made more brick, and that takes more. The number of inmates has increased twenty-five or thirty per cent., and that requires more cooking and more washing, and that increased our fuel bill. I think last year it was about $2,600—I wouldn't be positive about it—but we burned more brick. You can't estimate that in the future except to calculate upon a steady increase. As the institution grows larger that expense will naturally increase—that fuel—with other expenses.

Re-examination:

1 Q. Have you made any effort to secure natural gas for the use of the work-house?

A. Yes, sir; the board had a conference with the company. Their accredited agent met with the board once or twice. We received two different propositions from one of the gas companies. I think it was the Northwestern Company. We had their communication last fall, and their agent met with the board once.

2 Q. Have you been able to secure gas for fuel purposes at less than the cost of coal or wood?

A. No, sir; our books show the actual cost for fuel in the preceding year, and the price they set for gas was higher than the cost of coal, and for that reason we didn't contract for it. It was their intention to contract for gas if it was cheaper.

Recross-examination:

1 Q. Was the price that they offered to furnish gas for to burn brick higher or lower?

A. No; for burning brick it was lower; but in their price for heating the building they wanted to estimate it at so much for the year, and that was more than the entire amount for heating the preceding year or just the same. It was $450 over and above the actual cost of heating the building, that being the amount used for burning brick.

2 Q. Did you keep a separate fuel account with the brick yard and the building prior to that date?

A. No; but it is easy to ascertain. We know as a general thing how much fuel we burn in a kiln of brick. If we know the number of arches we can ascertain that from the number of brick we burn. We can get within a few dollars for the entire season's work; we know about the average amount of fuel used to each arch.

3 Q. How much did the natural-gas companies want to charge you for the heating of your building and doing the cooking?

A. Their first price was $1,200.

4 Q. What was the last price set?

A. I think the last I saw in writing was $1,000. I understood that some person who claimed authority had said they thought they might get it down to $800; but the last communication was $1,000.

5 Q. What fires have you in the building?

A. One cooking range in the kitchen and a fire under the boiler which does all the heating, and we have in the laundry a large box stove in a brick arch for heating the flat-irons. There are no open-grate fires in the institution, and just one cooking stove for all the cooking. The building is heated with dry steam heating, with a boiler outside, in a separate building—in an addition to the main building.

6 Q. What is the size of the building?

A. I can tell you; the front is about—it must be between fifty and sixty feet. The main part runs back probably about forty feet, and then from there on, in the prison part, it is two stories high; and then the prison is the same width, running back fully ninety feet—I should say, further; they are of the same width—that is, the width in the cells, which make three tiers of cells, built in the center

of the building, and, of course, a stairway leads up. The cells are built ten or twelve feet clear of the wall, and walks along the outside of each tier of cells. There are 14 cells, which will average about *every* five feet in width, and then comes an opening between them, which makes eighty or ninety feet; that is the prison part.

7 Q. How many people will it accommodate?

A. It will accommodate 168 people—that is, putting two prisoners in the cell. There are 84 cells, and they are designed that there can be two persons put in the cell.

8 Q. What is the other capacity beyond the cells? How many people will it accommodate—prisoners, attendants, &c.?

A. There are no attendants that stay there except during the work hours, only myself and wife. We live there. The balance of the guard all live at home and come there during the work hours; they don't eat nor sleep there, except that they bring their dinners with them. Their cooking and washing is not done there. If we have more, we have to put them on the floor; that is the only accommodation we have. We never have to exceed—when we get up to 120 or 130 prisoners, that is all we have beds for. The cells are there, but we require additional beds.

9 Q. You have never kept a separate fuel account for the building—between the building and the brick yard?

A. No; I couldn't possibly do that. I buy my coal by the carload. If I am burning coal and they run short at the boiler-room, I run a load or two from that car over to the boiler-room. I get the car weight, and so I couldn't tell, unless I was over there and ordered over a lot and saw where it went to. We do the business at the best convenience.

10 Q. The gas companies offered to furnish gas cheaper than you could get coal?

A. They offered it at 65 cents per thousand for burning, and that is a little cheaper than wood and coal—cheaper than our estimates, at least.

276 Also WILLIAM KIRKBY, a witness of lawful age, being first duly sworn, testified as follows:

Direct examination by Mr. BROWN:

1 Q. You may state your name, age, residence, and occupation.

A. William Kirkby; age, 46; residence, Toledo; occupation, infirmary director.

2 Q. In your official capacity of infirmary director, have you charge of the infirmary department of the city of Toledo?

A. Yes, sir.

3 Q. Can you state what it has cost the city of Toledo for fuel during the period of one year past, in the infirmary department?

A. Yes, sir; $8,198.01.

4 Q. What was the character of the fuel so furnished in your department?

A. Well, there was about 1,100 cords of wood and the balance was coal.

5 Q. Was there any portion of it natural gas?
A. No, sir.
6 Q. For what period was this?
A. That runs from June 1st, 1888, to June 1st, 1889.

Cross-examination by Mr. SCOTT:

1 Q. What was this fuel used for?
A. For the poor. That is just the fuel that was used for the poor of the city.
2 Q. As fuel that is distributed to the poor of the city?
A. Yes, sir.
3 Q. All of it?
A. Yes, sir.
4 Q. You mean to say that this is fuel distributed under you to the paupers of the city?
A. Yes, sir.

277 Also ALBERT E. MACOMBER, a witness of lawful age, being by me first duly sworn, as hereinafter certified, deposes and says:

Direct examination by Mr. BROWN:

1 Q. State your name, age, residence, and occupation.
A. Albert E. Macomber; age, fifty; residence, Toledo, Ohio; occupation, real-estate dealer.
2 Q. What official connection, if any, have you with the Manual Training School of the city of Toledo?
A. I am a member of the board of directors, and also act as secretary of the board.
3 Q. State, if you please, what the Manual Training School is, and what relation it sustains to the city of Toledo.
A. It is one of the departments of the public-school system of the city.
4 Q. In what manner is it sustained?
A. By public taxation.
5 Q. You may state, if you can, what is the cost of fuel for heating the Manual Training School for the period of a year past.
A. Three hundred dollars.
6 Q. Is this the regular cost per annum, or for any particular year?
A. That was the charge made by the Northwestern Ohio Natural Gas Company last year, and they have just renewed the contract at the same price.
7 Q. The fuel used is natural gas, is it?
A. Yes, sir.
8 Q. Have you the means of knowing how that cost compares with the price of coal?
A. It is just about the same.

Cross-examination by Mr. SCOTT:

1 Q. Do you know what the cost was for fuel to the Manual Training building before they used natural gas?

A. Yes, sir.

2 Q. What was it?

A. Perhaps three hundred and five or three hundred and ten dollars.

3 Q. Don't you know exactly what it was?

A. I have not the figures before me.

4 Q. Do you know?

A. We look at the price paid to the Northwestern Ohio Natural Gas Company as high as the same amount of heating would cost provided by coal.

5 Q. I asked you if you knew what was the amount you paid for coal before you used natural gas, for the same period?

A. For one year before it was some two hundred and seventy-five dollars. I think another year it was about three hundred and five.

6 Q. What was the reason for the increase there?

A. It was one year when coal was a little higher, and I think there was perhaps one additional room.

7 Q. How do the number of rooms now compare with the time when you used coal?

A. The same.

8 Q. Is the fuel used for furnishing power in the building?

A. Yes, sir.

9 Q. What do you run there?

A. A small engine.

10 Q. Is the same machinery there now as it was when you used coal?

A. Yes, sir.

278 11 Q. What do you run there?

A. A small engine.

12 Q. Is the same machinery there now as it was when you used coal?

A. Yes, sir.

13 Q. Is there not an increased amount of machinery?

A. No, sir.

14 Q. How long have you used natural gas there?

A. Natural gas was introduced at once—as soon as the system was completed here; I think we have used it for two years, and we are now beginning the third.

15 Q. And there is no more machinery now in than there was over two years ago?

A. No, sir.

16 Q. And there are no more rooms heated, and no more rooms used in the Manual Training School than there were two years ago?

A. The natural gas is applied to the boiler which manufactures steam, and it is the steam that distributes the heat to the building.

17 Q. I asked you whether there are any more rooms used now than there were two years ago?

A. No more rooms now than there were two years ago.

18 Q. Are there any more than there were three years ago?

A. Yes, sir.

19 Q. And you are now on your third year with natural gas?

A. Yes, sir.

20 Q. How many more rooms are there used now than there were three years ago?

A. One.

21 Q. And when you speak of the coal bill being the same as the gas bill is now, or nearly the same, there was one room less to heat than there is now, was there not?

A. I don't know; perhaps there was.

22 Q. What was the last coal bill that you paid three years ago?

A. I have not the figures before me; it was somewhere in the neighborhood of three hundred and five dollars, if I estimate it from my recollection.

23 Q. It was over three hundred dollars, was it—haven't you compared the natural gas with the coal bills?

A. Yes, sir.

24 Q. And don't you know exactly what the coal bill was three years ago?

A. It was about three hundred and five dollars, as I recollect it.

25 Q. Don't you know exactly?

A. No, I do not; but I know that our estimate is——

26 Q. We don't want your estimate; you are here as an official to give the figures.

A. I have not them here.

27 Q. Is the fuel account kept separately between the High School building and the Manual Training building?

A. Yes, sir.

28 Q. The fuel is not kept in the same place for the two buildings?

A. No, sir; the entire system is separate, and paid for separately.

279 Also THOMAS R. WICKENDEN, of lawful age, being first duly sworn, as hereinafter certified, deposes and says:

Direct examination by Mr. BROWN:

1 Q. You are the city engineer of the city of Toledo, are you?

A. Yes, sir.

2 Q. And the same person who has heretofore testified in this case?

A. Yes.

3 Q. You may state, if you can, the number of electric lights in use in the city of Toledo for the purpose of lighting the streets at the present time.

A. For the purpose of illuminating the streets, there are at present four hundred and ninety-seven.

4 Q. What number, if any, are there ordered and not yet placed?

A. There are eleven ordered and not yet placed.

5 Q. Are these the lights furnished under the contracts referred to in your examination by the plaintiffs?

A. Yes, sir.

7 Q. Do these lights include lights used for anything except street-lighting?

A. Street-lighting only.

Cross-examination by Mr. POTTER:

1 Q. How many lights are there now?

A. 497—that is, at this present time.

2 Q. There are pending before the council ordinances and resolutions looking to the extension?

A. No; there are already eleven lights ordered for which the legislation is complete. There are ordinances before the council at the present time pending which will call for about thirteen more.

3 Q. Practically, the main thoroughfares of the city are lighted with electric lights?

A. Yes, sir.

4 Q. Under the contracts which you have mentioned in your prior testimony?

A. Yes, sir.

280 Also HARVEY W. COMPTON, a witness of lawful age, being first duly sworn, as by me hereinafter certified, deposes and says:

Direct examination by Mr. BROWN:

1 Q. State your name, age, place of residence, and occupation.

A. Harvey W. Compton; age, 36; residence, Toledo, Ohio; superintendent of the Toledo public schools.

2 Q. Are you also secretary, in your official capacity, of the board of education?

A. I am.

3 Q. You may state if you can furnish a statement of the cost of fuel used in heating the public-school buildings in the city of Toledo.

A. I can.

4 Q. Will you please do so, making the same a part of your evidence; stating also the period covered by your statement.

A. The cost of fuel for heating the public-school buildings for one year, beginning with September, 1887, and ending August 31st, 1888, including gas, wood, kindlings, and everything used by the janitors in the school buildings, is as follows:

Central High School	$707 00
Broadway	233 80
East Toledo	208 32
Erie	198 00
Hoag	126 84
Illinois	239 94
Jefferson	192 00
Lagrange	200 00

Nebraska and annex	$369 00
Sherman	309 00
South	236 81
Stickney	200 00
St. Clair	185 72
Southeast Toledo	75 00
Warren	356 00
Washington	233 80
The total of those buildings is	$4,031 23

The foregoing being buildings heated with natural gas.

The following buildings are heated with wood or coal:

Brown's Addition School	57 13
Ironville	70 00
Manhattan	67 31
North Toledo	63 87
Parkland	66 22
Howland	36 75
Junction (Air Line)	35 13
Tremainsville	57 25
Walbridge	81 55
South-Street Annex	67 08
St. Clair Annex	77 00
The total of that is	$679 29

The different kinds of fuel used cost as follows:

Natural gas	$4,071 23
Wood	682 06
Bituminous coal	436 60
Anthracite coal	129 38
Kindlings and prepared fuel	178 53
Making a total of	$5,497 80

This is all in the year ending Aug. 31, 1888. During the
281 month of September and part of October, 1887, before gas was furnished in that year, the cost for wood and coal was $747.28, and is not included in the list of school buildings.

5 Q. Can you furnish a statement of the cost of fuel for the year ending August 31st, 1889, without mentioning the buildings in which it was used?

A. I can.

6 Q. You may please do so.

A. For the year ending August 31, 1889, the cost—

For natural gas	$4,614 21
For wood	488 97
For bituminous coal	162 94
For kindlings, etc.	95 92
Total	$5,362 04

Cross-examination by Mr. POTTER:

1 Q. What time in September of 1887 did the school begin?

A. It was on the first Monday in September. It varies a little. I would have to look at the calendar to see.

2 Q. And down to what time in October was it when you began to use natural gas as a fuel for heating purposes?

A. I would have to look at the record or the bills to get the exact date. They were not all piped at the same time. We began about the middle of October, I think, to use the first gas.

3 —. When did you begin to use fuel for the heating of your buildings?

A. We usually have to have a little fire in the morning early in September; it begins to get cool, and we have just a little fire in the morning then and drop it off.

4 Q. And that would last through down until the middle of October?

A. Yes; we get along in that way and then we have to have steady fires.

5 Q. During the day and also at night?

A. Yes, sir; we keep them going at night, too, right along.

6 Q. What was the cost of fuel for the same service—that is, the heating of the same buildings—where coal was used?

A. I have brought the tables here.

7 Q. Just refer to them, if you please. Take, for instance, the Central—the cost of gas and the cost of coal—what did you pay for—beginning September, 1886, down to and ending August 31, 1887, what did you pay out for the same building for coal?

A.—

The Central that year for coal was	$785 86	
East Toledo	258 78	
Broadway	263 27	
St. Clair	206 35	
Warren	395 58	
Erie	224 07	
Stickney	226 69	
Sherman	346 95	
Washington	280 30	
Jefferson	217 30	
Nebraska	413 75	(That includes the annex.)
Illinois	266 60	
South	263 12	
Lagrange	218 99	
Hoag	126 84	
Southeast Toledo	96 85	
Parkland	45 95	
Junction	17 11	
North Toledo	67 58	
Manhattan	66 30	
Brown's Addition	81 60	

St. Clair Annex	$86 10
Broadway Annex	188 00
Ironville	55 20
Howland	35 60
Tremainsville	81 56
Walbridge	51 00
Total	$5,180 88

8 Q. What new buildings since August, 1887, have been constructed in Toledo *have been constructed in Toledo* in which natural gas is now used as a fuel?

A. There was only one up to the end of last year in which we used natural gas, and that was the big Segur building.

9 Q. When was that built?

A. A year ago last summer. We occupied it very near the beginning of last year.

10 Q. How large a building is that?

A. It is a twelve-room building. We do not occupy all of the rooms yet. We have three vacant rooms there yet.

11 Q. What is the price that you are paying for the heating of that now—that is, the natural-gas contract?

A. I think it is the same as Broadway, $233.80; that is my recollection. We have added two new buildings this year, so that there are three new buildings now in addition to what this report for the year ending August 31st, 1888, shows.

12 Q. Have there been any annexes besides the three buildings which you have spoken of in which natural gas is used?

A. No; nothing in which we use gas.

Re-examination:

1 Q. How many more buildings are there in your statement for the year ending August 31, 1888, than in your statement for the year ending August 31, 1887?

A. There are two more buildings.

2 Q. How many additional rooms are there?

A. As nearly as I can recollect there are five new schools—three at the Segur building, one at the Hoag, and one at the Parkland—added that is not heated by gas.

3 Q. Are there any school buildings for which you have made application for natural gas without being able to secure it?

A. I think not. After waiting a little while we have been able to secure it. In our old wooden single-room buildings out in the suburbs we thought it would not pay to go to the expense of
283 piping that distance. We have only piped four, six, eight, and twelve room buildings.

4 Q. Are the school buildings now heated by coal and wood outside of the territory at present supplied by the present natural-gas companies?

A. No, sir; not all of them.

5 Q. What ones are?

A. Yes; at Manhattan and at Brown's Addition they are near; but we could use the fuel at about as good advantage as to pipe those wooden buildings; that we would probably have to abandon.

6 Q. Have the school buildings heated by natural gas been at all times supplied by the companies under the existing contracts since they were first made?

A. Yes, sir; on the whole they have been very well supplied. A few extremely cold days and a few accidents which have occurred have caused us to dismiss the children, but very seldom.

7 Q. Has there been any change in the contracts since those were first made?

A. Not in the actual price of gas, but they have modified the contract so as to require the board to attend to all fitting and plumbing, so that we have had to hire our own plumbers to look after the gas and the fittings in the buildings. They did that the first year. After that they gave notice that they would do no more fitting.

Recross-examination:

1 Q. I notice, by the statements you have made here, that where natural gas is used there is a material reduction in the cost of fuel in the several buildings; where wood and coal were continued there was no reduction; on the contrary, quite a material increase in the fuel bill. Will you please explain that?

A. The price of gas remained constant, while the price of wood and and coal in different years has fluctuated.

2 Q. Then I would infer that the price of wood and coal for the year ending in the summer of 1888 was more than it was for the year ending in 1887?

A. I think it was, in some respects, more. The price of coal and wood not only fluctuated, but the amount differed in different seasons according to the degree of cold.

(The further hearing of depositions herein is adjourned to Saturday, November 16th, 1889.)

284 SATURDAY, *November 16th*, 1889.

Met and adjourned, by consent of counsel, to Monday November 18th, 1889.

MONDAY, *November 18th*, 1889.

Met, by consent, at the office of E. D. Potter, Jr., to continue the taking of testimony herein.

Present: For the complainants, A. W. Scott, Esq.
" For the defendants, Clarence Brown, Esq.

HAMILTON S. CORWIN, of lawful age, having been heretofore sworn herein, testified and deposed as follows:

Direct examination by Mr. BROWN:

1 Q. You are the Hamilton S. Corwin who has testified heretofore in this case, are you?

A. Yes, sir.

2 Q. At present the auditor of the Northwestern Ohio Natural Gas Company?

A. Yes, sir.

3 —. How long have you been connected with the gas companies in Toledo or either of them?

A. Since the Northwestern first began work here.

4 Q. At what time was that?

A. I can't say positively.

5 Q. The year?

A. The year is what I am trying to think of. The first time that I came to Toledo on business connected with the pipe line was in December. It must have been 1886; that is what it was; that was the first.

6 Q. In what stage was the work of piping gas from the fields to Toledo by the Northwestern Company at the time you came here?

A. I came here at that time to receive the first pipe that was unloaded in Toledo.

7 Q. What part, if any, of the main line from the field had been constructed at that time?

A. I can't recolleet. I would have to refer—in order to tell I would have to freshen my memory in some way to determine whether we had actually commenced laying the main line then or not.

8 Q. It was, practically, the beginning of the work when you came here?

A. As I remember it; yes.

9 Q. What position did you take when you came here—what official position did you occupy in the company?

A. I was general superintendent of the company.

10 Q. You continued such down to what time?

A. Down to about two months ago.

11 Q. To the time of the consolidation of the two companies?

A. Yes; it was about that time. I can't give the exact dates.

12 Q. Up to about September last there were two companies engaged in the supplying of gas to the consumers in Toledo, were there not?

A. There have been two companies supplying gas up to a recent date.

13 Q. Those were the Northwestern Ohio Natural Gas Company, of which you were the general superintendent, and the Toledo Natural Gas Company, were they not?

A. Yes, sir.

285 14 Q. And the two companies are at present under one management, I believe, without actual consolidation?

A. They are under one management.

15 Q. Are you auditor in charge of the business of the two companies under that management?

A. Yes, sir.

16 Q. What was your business prior to coming to Toledo to take charge of the business of the Northwestern Natural Gas Company as superintendent?

A. I was engaged in the New York office of the Standard Oil Company.

17 Q. How long had you been engaged there?

A. I should have to freshen my memory to answer that question.

18 Q. About how long?

A. Two or three years. I am a little uncertain.

19 Q. In what capacity were you employed there?

A. In various capacities.

20 Q. In office work or as superintendent of outside work?

A. Office work.

21 Q. You stated, upon your former examination, that the main line from the field to Toledo was connected with the general system of lines of your company. Will you state of what that system consists?

A. The lines to Fostoria and Fremont.

22 Q. What is the size of the line from the field to Fostoria? What is the diameter of the pipe?

A. Six-inch.

23 Q. What is the length of the main line—of the Fostoria main line—I speak of?

A. I think it is about five miles.

24 Q. What are its termini?

A. The wells near Bloomdale.

25 Q. In what county?

A. Wood county.

26 Q. In what township?

A. It seems to me it is in Bloom township; anyhow, it is Bloomdale.

27 Q. Is it north or south of the B. & O. railroad—I mean the termini of the line?

A. They are at "Godsend wells," so called, near the Godsend water station of the B. & O. railroad—the Kelley farm.

28 Q. I believe you have said there were wells and their connections which were used for the purpose of supplying the Fostoria line only. Is that the fact—I mean ordinarily?

A. Yes, sir; ordinarily.

29 Q. How many wells are there connected with the Fostoria line?

A. I should have to refer to maps to answer that question correctly.

30 Q. Can you tell us approximately how many wells there are connected with that line?

A. I would rather testify correctly, if at all.

31 Q. Are you willing to examine your records and then testify?

A. I am willing to answer that question; certainly, sir—that is, I can find out from the books at the office.

32 Q. Can you state the capacity of those wells?

A. No, sir.

33 Q. Is the record of their capacity kept by your company or by any of its employés?

A. There is no record kept under my charge in the office.

34 Q. Was there any kept while you were superintendent?
286 A. No, sir; not as a book record. What Mr. Stock may have kept I don't know.

35 Q. Do you mean to say that your company does not know the capacity of its wells?

A. I mean to say that I do not know the capacity of the wells.

36 Q. Have the officers of your company any means of ascertaining the capacity of the wells owned by the company?

A. I presume they could ascertain.

37 Q. In what manner?

A. By the ordinary methods adopted in such cases, whatever they might be.

38 Q. Do you mean by making measurements?

A. By making measurements.

39 Q. Do you mean to say that no measurements have yet been made or recorded?

A. No, sir; I don't mean to say that. I mean that Mr. Stock may have kept such records. I don't know how for he has kept those records.

40 Q. Isn't the capacity of the wells reported by Mr. Stock to the company or to any officer?

A. Yes, sir; there have been reports made.

41 Q. To whom?

A. Well, there have been some made to me at times, and what reports he may have made to others I don't know anything about.

42 Q. Have you access to the reports made to you?

A. I don't think I have.

43 Q. What has become of them?

A. I don't know. In fact, I have not been at all very careful about keeping any such reports.

44 Q. What is the size of the Fremont line?

A. Well, it is now ten inches.

45 Q. Has it ever been any other size?

A. Yes, sir.

46 Q. When?

A. It was eight-inch until recently.

47 Q. Why was it made ten?

A. Increasing the capacity of our line to reach other points.

48 Q. Has the entire Freemont line been relaid?

A. Oh, yes; the line has been laid to Fremont.

49 Q. All the old eight-inch pipe taken up, was it?

A. Not all the old eight-inch pipe we had in the field.

50 Q. I mean all the old eight-inch pipe you had in the main line to Fremont. Has that been taken up?

A. Yes, sir.

51 Q. And replaced with ten?

A. Replaced with ten.

52 Q. How recently has that been done?

A. It has been completed within a month.

53 Q. When was the work commenced—about when?

A. If I remember rightly, about three months ago.

54 Q. What are the termini of the ten-inch line?
A. Fremont and a station west of Fostoria, called Gravel Pit.
55 Q. In what gas field is that?
A. It is just south of Perry township field, not far west of Fostoria, in Washington township, Hancock county.
56 Q. Can you state how many wells the company connect with on that line?
A. No, sir.
57 Q. Can you ascertain from your books?
A. Yes, sir.
287 58 Q. Will you do so?
A. Yes, sir.
59 Q. Can you state the capacity of those wells, or have you the means of ascertaining their capacity?
A. No, sir; I have not.
60 Q. Who is in charge of the field for your company at the present time?
A. C. L. Stock.
61 Q. What other towns, if any, besides Fremont are supplied from this line?
A. You mean the Fremont line?
62 Q. From the Fremont line.
A. There are no other towns at present being supplied, excepting the little towns along the line between Fostoria and Fremont. There are three or four little towns there.
63 Q. For what purpose was it enlarged?
A. To take us to Bellevue, Clyde, and Sandusky.
64 Q. What, if anything, is your company doing at the present time toward constructing the line to Bellevue, Clyde, and Sandusky?
A. They are engaged in that work.
65 Q. What is the size of the line that is being constructed to those places?
A. From Fremont it is eight inch.
66 Q. Are they all connected with this eight-inch line?
A. It is proposed that they shall be.
67 Q. And are to be supplied through one eight-inch line?
A. That is the proposed work now.
68 Q. Is your company also engaged in piping these towns named for the distribution of gas?
A. Yes, sir.
69 Q. What is the population of Sandusky—approximately?
A. Of course, all I know about it is hearsay.
70 Q. Well, approximately?
A. I suppose it to be about eighteen thousand.
71 Q. What is the population of Clyde?
A. I understand Clyde is between three and four thousand.
72 Q. And Bellevue.
A. Bellevue a little larger; possibly a little over four thousand.
73 Q. And what is the population of Fremont?
A. I have understood it to be ten thousand.

74 Q. About what would be the aggregate population of the other smaller towns to which you have referred as being connected with this line?

A. I don't think I can answer that question intelligently. They are simply small hamlets—very small places.

75 Q. How many are there?

A. Amsden, Kansas, and Burgoon are the towns on the Fremont line, so called.

76 Q. Were you in charge of the building of the Fremont line at the time it was constructed?

A. Very general charge.

77 Q. How long was that in process of construction?

A. I can't tell you; I don't remember.

78 Q. Is your company engaged at present in constructing
288 any other lines in that vicinity?

A. I don' think of any.

79 Q. Or in constructing any lines from the Findlay or Wood county field—any other lines?

A. I don't think of any.

80 Q. Do you know whether a line is being constructed through and from the city of Toledo towards Detroit, to the Michigan State line?

A. Yes; there is such a line being constructed.

81 Q. By whom is that being constructed, if you know?

A. That has been constructed by the Northwestern Ohio Natural Gas Company to the State line.

82 Q. With what gas field is it proposed that that line shall connect?

A. The same field that supplies Toledo.

83 Q. How is it connected with the field from Toledo or to be connected?

A. I understand that it is to use one of the lines now supplying Toledo.

84 Q. Which one?

A. The old Toledo Company line.

85 Q. That is the ten and twelve inch line, is it?

A. That is the ten and twelve inch line.

86 Q. What is the size of the line being laid from Toledo to the State line?

A. Twelve-inch.

87 Q. What is the distance from the point of connection with the old Toledo line to the State line, between Ohio and Michigan, approximately?

A. I can't state positively.

88 Q. About?

A. I understand it is about eight miles.

89 Q. And what was the length of the old Toledo main line?

A. I can't answer positively. I think it is 33 miles—33 or 36. I am not positive which.

90 Q. For what purpose is the Northwestern Ohio Natural Gas

Company constructing the line to the State line in the direction of Detroit?

A. I can only say that I presume it is to supply a line running to Detroit.

91 Q. Don't you know that such an arrangement has actually been made with your company for that purpose?

A. Yes, sir; such an arrangement is under way.

92 Q. What, approximately, is the distance from the State line to Detroit?

A. I don't know.

93 Q. With what company has the Northwestern Ohio Natural Gas Company made this arrangement to supply gas to the Detroit line?

A. I understand it is called the Michigan Gas Company.

94 Q. Are you acquainted with the owners or officers or stockholders of that company?

A. No, sir.

95 Q. With whom was the contract made as the representative of that company—with whom was your company's contract made?

A. I can't say positively. I never saw that contract.

96 Q. Is it in your possession or among the files of your office?

A. I think not.

97 Q. Is that Detroit line being laid at the present time?

A. Yes, sir.

98 Q. Who is constructing it, if you know?

A. Do you mean the superintendent in charge?

289 99 Q. No; the contractor.

A. The work is being done by Mr. Lambing, formerly superintendent of the Toledo Natural Gas Company.

100 Q. When did he leave the employ of that company?

A. I think it is about three months since.

101 Q. About the time when that company and the Northwestern Ohio Natural Gas Company passed under one management?

A. About that time.

102 Q. Is he in charge of the work as superintendent or as contractor?

A. I am very unfamiliar with it, but I understand he is superintendent of construction.

103 Q. Is he the same person who superintended the construction of the Toledo line from the Findlay field to Toledo?

A. Yes, sir.

104 Q. What is the size of the line that is being laid to connect with your line at the State line?

A. I understand it is twelve-inch.

105 Q. Has your company a line to Tiffin?

A. Yes, sir.

106 Q. What is the length of that line?

A. I can't give you the length, but you might scale it. I can tell you about where it is; it runs from a point about three miles east of Findlay to Tiffin.

107 Q. What is the size of that line?

A. Eight-inch.

108 Q. Does that supply any other cities or places than Tiffin?

A. There may be a little hamlet or two on it, as there are on some of our other lines, but no place of any size or importance.

109 Q. About what is the population of Tiffin?

A. I understand it to be about the same as Fremont—somewhere from eight to ten thousand.

110 Q. Can you give the number of wells connected with the Tiffin line?

A. No, sir.

111 Q. Will you ascertain from your books and testify on that subject, if possible?

A. I will try to.

112 Q. Is that all of the lines owned by the Northwestern Ohio Natural Gas Company and the Toledo Natural Gas Company besides the two Toledo lines?

A. Yes; that is all.

113 Q. Then, as I understand it, the Northwestern Ohio Natural Gas Company and the Toledo Natural Gas Company together own and control the following lines: The Northwestern Natural Gas Company's lines from the Findlay field to Toledo, about thirty-six miles; the Toledo Natural Gas Company's lines from the Findlay field to Toledo, about thirty-six miles; the line from Toledo to the Michigan State line, about eight miles; the line from the Wood county field to Fostoria, about six miles; the line from Washington township, Hancock county, to Sandusky, neraly fifty miles, and the line from the Findlay field to Tiffin, about twenty-five miles?

A. I think that is right.

114 Q. Within what time have these lines been constructed?

A. I think they were commenced in August, 1886; I think that was it. I came to Fostoria in August, 1886, and it was about that time they commenced constructing the lines.

290 115 Q. Do you know of any high-pressure line laid in Northwestern Ohio larger than twelve-inch?

A. I do not.

116 Q. What other lines have been constructed from the Findlay and Wood county field for the purpose of supplying towns in Northwestern Ohio besides those controlled by the Northwestern Ohio Natural Gas Company?

A. I don't know.

117 Q. Do you know of any?

A. I don't know of any gas towns excepting Findlay.

118 Q. Findlay has constructed its own line, has it not, lately?

A. Findlay was a gas town before I came to this part of the country.

119 Q. What do you know about Bowling Green having constructed a line?

A. I didn't think of Bowling Green when I replied. Bowling Green and Portage have gas. I don't know exactly how their lines are constructed.

120 Q. Do you know whether Bowling Green has two lines?

A. I don't know anything about it, excepting in a general way that Bowling Green has gas.

121 Q. Has Fostoria a line of its own?

A. Yes, sir.

122 Q. I mean besides the one controlled by your company?

A. Yes; it has. I should have so stated when you asked me about any other towns had I remembered it at the time.

123 Q. Do you know whether North Baltimore has a line of its own?

A. I don't know. By the way, I should correct myself again in regard to that. Tiffin has a line of its own. I was trying to think of other towns that had gas.

124 Q. What do you know about a line being constructed at the present time to Kenton, Ohio?

A. I know very little about it except in a general way—that I heard that such a line was being constructed.

125 Q. Do you know by whom that is being constructed?

A. I do not.

126 Q. It is not being constructed by your company?

A. No, sir.

127 Q. Who are the general officers of the Northwestern Ohio Natural Gas Company at the present time?

A. Hon. Charles Foster is president; John E. Wilkison is secretary and treasurer; C. N. Payne, manager; John Tonkin, Jr., assistant manager, and myself, H. S. Corwin, auditor.

328 Q. Is the organization of the Toledo Natural Gas Company maintained?

A. I don't know positively.

129 Q. Who are the stockholders of the Northwestern Ohio Natural Gas Company at the present time, so far as you know?

A. Of course, I can't remember.

130 Q. As far as you remember, give us the principal ones.

A. I can't answer it.

131 Q. Do you know of any?

A. Why, I know of some whom I think are stockholders.

132 Q. Are you a stockholder yourself?

A. No, sir.

133 Q. Have you attended the stockholders' meetings at any time?

A. Yes; I was present at one meeting.

134 Q. Give us the names. Governor Foster is a stockholder, is he not?

A. I understand him to be.

291 135 Q. Have you ever seen him present at the stockholders' meetings?

A. Yes, sir.

136 Q. Mr. Payne you have also seen present at the stockholders' meetings, have you not?

A. Yes, sir.

137 —. L. H. Smith, formerly president of the Toledo Natural Gas Company——

A. I think he is a stockholder. I can't swear positively to any of them.

138 Q. Haven't you seen him present at the stockholders' meetings?

A. Yes, sir.

139 Q. Mr. Daniel O'Day is a stockholder?

A. I can't swear positively.

140 Q. Have you ever seen him present at the meetings?

A. Stockholders' meetings; no, sir.

141 Q. Or the directors' meetings?

A. At the directors' meetings; yes, sir.

142 Q. Mr. O'Day is one of the directors of the Northwestern Ohio Natural Gas Company, is he not?

A. Yes, sir.

143 Q. Is Judge Doyle a stockholder or an officer of the corporation—I mean John H. Doyle?

A. He is the general attorney.

144 Q. Do you know whether or not he is one of the stockholders?

A. I suppose him to be.

145 Q. Have you seen him present at the stockholders' meetings?

A. Yes, sir.

146 Q. Mr. A. W. Scott also?

A. I never saw him at the stockholders' meetings.

147 Q. As a stockholder?

A. No, sir.

148 Q. Who are the regular counsel of the Northwestern Ohio Natural Gas Company?

A. Doyle, Scott & Lewis.

149 Q. And who was formerly the counsel of the Toledo Natural Gas Company?

A. I understand that Mr. E. D. Potter, Jr., is or that he was.

150 Q. What connection, if any, has Gov. Foster with the Standard Oil Company or with any of the companies connected with that organization or trust, whatever it is?

A. I do not know.

151 Q. What connection has Mr. O'Day with the Standard Oil Company?

A. I can't describe his connection.

152 —. What position does he hold there, if any?

A. I couldn't describe his position.

153 Q. Is he connected with the Standard Oil Company in any way?

A. I couldn't swear that he was. I presume that he is.

154 Q. What is his business in connection with the Standard Oil Company, if he has any?

A. His duties are varied, and I cannot describe them accurately.

155 Q. Are his duties in connection with the business of the Standard Oil Company?

A. Oh, yes; he has duties in connection with the business of the Standard Oil Company.

156 Q. What, if any, connection has Mr. Payne with the business of the Standard Oil Company, if you know?

A. I don't know of any business connections of Mr. Payne outside of the gas business.

292 157 Q. Did you know Mr. Payne before you came to Toledo?

A. No, sir.

158 Q. Do you know of his being connected in any way with the Standard Oil Company?

A. I do not.

159 Q. Do you not understand that to be the fact, Mr. Corwin?

A. I understand it—yes—that he is in some way connected with some of the interests of the Standard Oil Company.

160 Q. Is not that also true of Governor Foster, so far as you know?

A. No, sir; I don't know of any interests and I don't think he has any.

161 Q. Who has charge of the stock books of the Northwestern Ohio Natural Gas Company?

A. The secretary, Mr. Wilkison.

162 Q. In your business as auditor have you occasion to know who are the stockholders of the company?

A. I never have been called upon to know; it never has run in the line of my duties so far.

163 Q. Either as superintendent or auditor?

A. No, sir; that branch of the business has been entirely with the secretary.

164 Q. Has it not been your custom to aid in the making up of the reports of the company to the stockholders and officers?

A. Yes, sir.

165 Q. And have not the reports to the stockholders from the directors and from the officers to the directors been made up from information furnished by you?

A. Largely.

166 Q. But the actual names of the stockholders are not in your custody or do not come within your line of duties?

A. No, sir.

167 Q. Will you tell us the number of wells that were connected with the Northwestern line when the Northwestern Ohio Natural Gas Company commenced furnishing gas to the city of Toledo, in 1887?

A. No, sir; I cannot.

168 Q. Will your books show?

A. No, sir; I think not.

169 Q. Will your books show the number of wells which you owned at that time?

A. Possibly; I suppose they would. I don't know.

170 Q. Do you not keep a record on your books to show the date at which each particular well is connected with the line?

200 Q. What is the pressure at which you supply manufacturing establishments, and the like?

A. Ordinary light manufacturing runs on the same pressure as the domestic consumption; many of them off from the low-pressure lines. Some of the larger manufactories run on a higher pressure. The rolling mill is, of course, a notable exception, and the principal exception.

201 Q. What pressure are you required to maintain in the field, as a rule, in order to maintain your pressure of 100 pounds at the city limits?

A. That varies altogether with the temperature, with the consumption, and all that. We have carried—I don't remember exactly, but it seems to me all pressures from 100, 115, 120 pounds up to 325, to maintain the pressure here.

202 Q. And that pressure is regulated by putting on or cutting off wells, is it not?

A. Yes, sir.

203 Q. Have you a regulator between the field and the main line down in the field?

A. Not unless—if we have any there is just one exception, and I am not positive whether that was arranged that way or not. We intended to put a regulator on the Melott well. None of the others have one on, as I remember it. That is only as I understood it in discussing the matter.

204 Q. Is there any regulator in the main line between the field and the city limits?

A. No, sir. I am speaking of the Northwestern line proper. I am not so well advised as to the old Toledo line, although that is in our charge now.

205 Q. Your statements refer to the line of which you had charge as superintendent?

A. Yes, sir.

206 Q. What, if anything, do you know as to the back pressure that is maintained on the wells when they are connected with the line and flowing?

A. I don't know much about that. We maintain pressure
295 at a certain point, but that may be remote from the wells; it is, as a rule, remote from the wells themselves.

207 Q. You speak of maintaining a pressure remote from the wells. Do you refer by that to the regulator in the main line?

A. No, sir; I refer to the central point in the field, at which we maintain a station or telegraph office, to which we can communicate with the men where we have our gauge located.

208 Q. At that station you have a regulator?

A. Not a regulator proper. We have gates in the line regulated by the men who turn it off or on—not an automatic regulator.

209 Q. You have a station at which these wells can be cut off?

A. Yes; we have various stations, but a couple of principal stations, at which points the lateral lines gather in, and there we have men stationed, and a telegraph office and gates.

210 Q. And that is where you reduce the pressure, is it not?

A. Well not as a rule. As a rule the pressure is not reduced there. As a rule the pressure is reduced by directing the men to go from that station out and turn off certain wells. In most instances we go to the wells to shut them off.

211 Q. It is at this station where you maintain, as you have said, at a point remote from the wells, a given pressure?

A. Yes, sir; when we say we have so much pressure at the field we mean that station.

212 Q. And back of that station, at the wells, the pressure would be greater than between the station and the main line, as a rule?

A. It would depend on how hard we were pulling.

213 Q. Can you tell, when you want 100 pounds pressure at the city line, how much pressure it is necessary to maintain at this station?

A. The men who have charge of the pressure watch that and increase it or diminish it as may be necessary to maintain the pressure, and by practice they, as a rule, know about how much they ought to have at a certain time——

214 Q. To meet a certain demand?

A. Yes. The pressure men know pretty well about regulating that.

215 Q. Do you know about what that pressure is?

A. That pressure that we have carried at that point has been all the way from 100 pounds to 325, according to the demands made upon the lines by increased consumption or lower temperature.

216 Q. If the end of the pipe were closed here and you had 100 pounds pressure the pressure down there would be entirely different from what it would be if it were open?

A. Yes, sir. I don't mean that at any time we could maintain 100 here if we had only 100 in the field; if we had 100 in the field it would be less than 100 here. With the consumption on the line there would never be the same pressure here as in the field, and the difference between those two pressures would be governed entirely by the consumption and the demands made upon the line.

217 Q. Are you able to tell what the loss is by friction on your line between the field and the city?

A. That point, it seems to me, is covered by the discussion we have just had in regard to that.

296 218 Q. Are you able to tell?

A. No; I am not.

219 Q. Are you able to tell what the loss is by leakage, on either of your lines?

A. No, sir.

220 Q. How many consumers have you in the city of Toledo?

A. I don't know.

221 Q. Approximately?

A. I can't state even approximately—that is, I wouldn't feel that was anywhere near correct in stating approximately.

222 Q. Can you state within one hundred or two hundred?

A. No, sir.

223 Q. Or within five hundred?

A. No, sir; I don't think I could.

224 Q. Have you ever known how many consumers your company has had?

A. Not at any one time, no, sir; I never have known.

225 Q. Have you ever made a report to your officers or directors, or stockholders, showing the number of consumers in Toledo?

A. We have made reports showing the number of fires of different kinds.

226 Q. When was that made?

A. There have been several such reports, as I understand.

227 Q. When was the last?

A. I don't think there has been one made within two months.

228 Q. How many fires were there at that time?

A. I don't remember.

229 Q. Can you tell from an examination of the reports?

A. Yes, sir.

230 Q. Will you do so?

A. Yes, sir.

231 Q. Can you tell as to both companies?

A. Well, I can approximate pretty closely as to both companies by reference to the figures. I don't remember.

232 Q. What is the gross income of your company from the consumers in the city of Toledo?

A. I can't answer; I don't remember.

233 Q. Have you made a report to your stockholders showing that?

A. There have been reports made; yes, sir.

234 Q. How recently?

A. There is a report made every month.

235 Q. Can you examine those reports and testify as to that definitely?

A. I could; yes, sir.

236 Q. Will you do so?

A. I don't know as I will be permitted to do so. I will say that I will try.

237 Q. You can ascertain the gross income from consumers in Toledo, can you not, from your books and reports?

A. I could do so; yes, sir.

238 Q. Is natural gas furnished by the Toledo and the Northwestern Ohio Natural Gas Companies to all who have made application in the city of Toledo?

A. I don't remember of any refusals.

239 Q. Have all manufacturing establishments in the city who have made application been supplied?

A. So far as I remember.

240 Q. The establishments at what is known as the Wagon Works, have they been supplied?

A. I understand they are consumers—you mean the Milburn Wagon Works Company?

241 Q. I mean other establishments there besides the wagon
297 works, at the station known as Wagon Works, or Auburndale;

have all of the establishments there who have applied been supplied with gas?

A. So far as I know; yes, sir.

242 Q. Have applications been made for gas in different parts of the city where no pipes have been laid?

A. Yes, sir.

243 Q. And in such cases you have been unable to furnish gas, have you?

A. Oh, yes; there have been instances; what I meant was, where we had lines laid.

244 Q. Have there been applications in portions of the city where you have not laid pipes?

A. Yes, sir.

245 Q. And you have been unable to comply with those applications?

A. Yes, sir.

246 Q. How numerous have those applications been; how extensive as to territory?

A. We have had a large number of applications of that kind.

247 Q. Coming from what parts of the city?

A. All the outlying districts surrounding our plant.

248 Q. Are you furnishing the hospitals, asylums, and other charitable institutions?

A. We are supplying a large number of them; there may be some that we are not; I can't state.

249 Q. What are those that you are supplying?

A. St. Vincent's Hospital and the St. Vincent's Orphan Asylum.

250 Q. You are furnishing all of the educational institutions, practically, are you not?

A. I think so; I don't know of any that we are not.

251 Q. You are furnishing the Asylum for the Insane, are you not?

A. We are supplying it.

252 Q. And you are supplying the engine-houses and the city buildings, the water works, and all the public institutions, practicaliy, are you not?

A. A very large number of them; I suppose nearly all.

253 Q. Are you acquainted at all with the natural-gas lines from the gas field to the city of Pittsburgh?

A. No, sir.

254 Q. What has been the effect, so far as you have observed, upon the prosperity and growth of the town in the gas fields in which gas has been found or to which it has been piped?

A. Well, I don't think I can answer that question intelligently as to directly what effect it has had; the towns seem to be prosperous, all of them, that I know of.

255 Q. Is it not true that there has been quite an unusual growth in population and industrial enterprises in those towns?

A. I understand there has been, largely, of some towns.

256 Q. Notably of Findlay, Fostoria, Bowling Green, North Balti-

more, Tiffin, Fremont, Toledo, and other towns in northwestern Ohio?

A. I have the same means of information on that point that others have; I have only known the rumors on that point.

257 Q. Do you not know, from your own observation, that in the past three years, since the discovery and piping of gas to the
298 various towns named, there has been a rapid and unusual increase in population and industrial enterprises in those towns?

A. The towns have seemed to prosper; whether it is entirely due to natural gas or not, of course I don't know. I have observed growth and prosperity in some of the towns named.

258 Q. Do you know in what other parts of the State of Ohio besides the Findlay and Wood county field, so called, natural gas is now found in paying quantities?

A. No; I am not posted on that point.

259 Q. Do you know to what other cities in the State of Ohio natural gas is at present being piped?

A. I couldn't name them.

260 Q. Can you name any?

A. I remember one. Youngstown is one.

261 Q. Gas being piped there at the present time?

A. Oh, no,

262 Q. To which natural gas is now being piped?

A. No, sir. I didn't understand your question. Gas is being consumed at that point—being used there.

263 Q. I refer now particularly to towns being piped from the Mercer county field and the Lancaster field?

A. I have no specific knowledge on those points.

264 Q. What, if any, arrangement or contract is there existing between your companies or either of them and the Standard Oil Company or any of its subordinate companies concerning the drilling of territory owned or controlled by either?

A. I don't know.

265 Q. Have you or has either of your companies a contract substantially of this character: that where a gas well is drilled in by the oil company you acquire it, and where an oil well is drilled in by the gas company the Standard Oil Company acquires it?

A. I have no specific knowledge upon that point.

266 Q. Do you know what is done with the oil wells that are drilled in by the gas companies?

A. I don't remember that we have drilled in any oil wells. We have no wells that we have disposed of as oil wells that I remember of at all.

267 Q. Isn't it your understanding that such an arrangement exists between either the Buckeye——

A. I understand there is some arrangement of that kind with somebody, but what it is I don't know. I say "that kind;" whether it is exactly of that kind I do not know. There is some arrangement on that subject, but what it is I don't know.

268 Q. Whereby the Buckeye Pipe Line Company or some com-

pany in the Standard Oil Trust—whereby if they secure gas wells your company obtains them; or if you obtain an oil well they secure it?

A. Some such an arrangement, but what it is I don't know.

(The further taking of testimony under the notice is, by consent of parties, through their counsel, adjourned to Thursday, November 21st, 1889, at 9 o'clock a. m., at the place specified in said notice.)

299 Also HARRY C. COTTER, of lawful age, being first duly sworn by me, as hereinafter certified, deposes and says:

Direct examination by Mr. BROWN:

1 Q. You may state your name, age, residence, and occupation.

A. Harry C. Cotter; age, 52; residence, Toledo, Ohio; I am filling the position of superintendent of the Toledo Water Works.

2 Q. As superintendent of the Toledo Water Works you may state if you know the cost of the fuel used at the water works for the year past.

A. Four thousand dollars; or, I would say, the contract is four thousand dollars, but we divide that four thousand dollars into twelve annual payments, which makes it a fraction less—something like four cents, I guess—but nominally it is four thousand dollars.

3 Q. What is the fuel used?

A. Natural gas.

4 Q. Do you use any coal?

A. No, sir.

5 Q. That, as I understand it, is the fuel used under the boilers at the pumping station, is it?

A. Yes, sir.

Cross-examination by Mr. SCOTT:

1 Q. That was for the year ending when?

A. Well, the year ending—we used gas in 1877 two months, and also the year 1888.

2 Q. It was for the year 1888 that you have had a contract of four thousand dollars per year for fuel with the natural-gas company, is that it?

A. Yes, sir.

3 Q. Preceding that time, what fuel had you used?

A. Coal.

4 Q. Can you state what the fuel bills were, before you used natural gas, per annum?

A. Well, I don't know as I can give you that from exact memory. We were paying for 1887—our coal bill for the first ten months was $1.91 per ton.

5 Q. About how many tons did you use?

A. We were using in the neighborhood of eight tons—seven and a half to eight tons—per day, and that is a mathematical calculation.

6 Q. Can't you tell, in round numbers, about what the annual bills were for coal?

A. I could tell you by reference to these records. (Witness refers to pamphlets.) Probably I could approximate the fact pretty close.

7 Q. Give me the year immediately preceding the time you began using natural gas.

A. We began to use gas in November, 1887. The total cost of coal for that year was $4,800.31.

8 Q. How does the amount of water furnished now compare with the amount furnished a year ago?

A. It is continually on the increase—the pumpage is increasing. In the year 1887 we pumped 1,551,000,000, in round numbers; in 1888 we pumped 1,747,000,000, in round numbers. For this year I have not got the estimates here; I could get them at my office for the first six months.

300 9 Q. For this year there will be an increase on last year?

A. Yes, sir; and a large one, too.

10 Q. But your fuel bills remain the same?

A. Yes, sir. In addition to that, I might suggest that, when we commenced burning gas, we did away with the services of one man. We are doing the same work—pumping more water, and the same work—the gas bill runs the same, and we save the services of one man; 365 multiplied by $1.75 per day would make $638.75, I think it is, and that added to the fuel bill would show the difference between gas and coal, what it would be.

(The further taking of testimony under this notice is, by consent of the parties, through their counsel, adjourned to Thursday, November 21st, 1889, at 9 o'clock a. m., at the place specified in said notice.)

301 THURSDAY, *November 21st*, 1889—9 a. m.

The taking of depositions resumed under this notice, pursuant to adjournment, at the office of Brown & Geddes, No. 63 Produce Exchange building.

Present, representing complainants: A. W. Scott, Esq.; representing defendants, Clarence Brown and G. W. Kinney.

HARMON F. GETTLEMAN, of lawful age, being first duly sworn by me, as hereinafter certified, testifies and deposes as follows:

Direct examination by Mr. BROWN:

1 Q. You may state your name, age, place of residence, and occupation.

A. My name is Harmon Filmore Gettleman; my residence is in Armstrong county, at Freeport, Pennsylvania; my age, thirty-nine years the 25th day of last October, and my occupation is contractor and superintendent of gas lines.

2 Q. How long have you resided in Pennsylvania?

A. All my lifetime, excepting odd contracts outside of the State now and then.

3 Q. How long have you resided at Freeport?

A. I have resided at Freeport about four months.

4 Q. Where did you reside prior to that time?

A. At Pittsburgh.

5 Q. How long did you live at Pittsburgh?

A. For about five years.

6 Q. And prior to that did you reside in that part of Pennsylvania?

A. I lived in the East a year and then went back to Pittsburgh again. I had lived in Pittsburgh before that.

7 Q. Then, the greater part of your life you have lived in Western Pennsylvania, have you?

A. Yes, sir.

8 Q. For how long have you been acquainted with the gas fields of Western Pennsylvania?

A. Since about 1876—from 1876 up.

9 Q. Since '76?

A. Yes, sir; principally all the time.

10 Q. And during what part of that time have you been engaged in work of different kinds in the gas fields?

A. All, with the exception of about three years—it might be something over.

11 Q. During that three or four years what was your business?

A. I was contracting in the ore business during those three or four years, and was in the hardware business a while. My contracting was in the iron-ore business.

12 Q. Have you had any experience in drilling for and developing gas in the Western Pennsylvania fields?

A. Yes, sir; I have.

13 Q. What?

—. Well, I have been superintendent and general manager of lines. I have dressed tools and turned junk and have drilled myself. I went from the foot up.

14 Q. You have drilled?

A. Yes, sir; and dressed tools. I had general charge of the work of the gas company and constructed it.

15 Q. To what extent have you had experience in the drilling of wells, either drilling yourself or as superintendent—that is,
302 how many wells, approximately, have you been familiar with?

A. About forty or fifty perhaps; perhaps more. I couldn't tell certainly. It might be a hundred, but I couldn't tell that. I would have to count all over Armstrong and Butler and Allegheny counties.

16 Q. How many wells have you been familiar with—that is, in your business as superintendent and otherwise—in the Western Pennsylvania fields?

A. I suppose forty or fifty; about forty-five, anyway.

17 Q. I mean now, not that you have had personally charge of, but to what extent have you been familiar with all of the wells that have been drilled there?

A. Oh, six or seven hundred wells, I suppose.

18 Q. Have you watched the progress of the development of gas in that territory?

A. Yes, sir; I have. That was my bread and butter, and that was all I had to go on.

19 Q. Have you been interested yourself in the territory as an owner?

A. Yes, sir; I have, to a certain extent.

20 Q. And as a builder of lines have you been interested also?

A. I have never had any stock in gas lines, but I have built them as contractor and as superintendent for other companies.

21 Q. In what portion of the field of Western Pennsylvania were you engaged?

A. I was engaged in the Butler county field and the Washington field, and somewhat in the Murrysville field; not a great deal in the Murrysville field.

22 Q. Are you acquainted with the other fields about Pittsburgh?

A. Yes, sir; I am.

23 Q. Will you state the natural-gas fields of Western Pennsylvania that are used to supply the city of Pittsburgh and the surrounding towns? Name them.

A. There is the Murrysville field, the Butler field, and the Westmoreland, and we have got the Washington, the Taylorstown, the Canonsburg, and the Hickory; it is all about one field.

24 Q. The last four named are all one field?

A. Well, principally one territory—in the the same district.

25 Q. What other fields are there that you you know of there?

A. I forget those fields—the Bellevernon, the Chartiers, the Beaver, the Sewickley. They are in one district and extensions of the Bellevernon field.

26 Q. Is there a Bradford field?

A. The Bradford has nothing to do with the city of Pittsburgh.

27 Q. What other fields outside of those which supply Pittsburgh are you acquainted with in Western Pennsylvania?

A. There is none outside of what I gave that supply Pittsburgh.

28 Q. Give those which supply any places outside of those which supply Pittsburgh.

A. Well, there is the McCain county field and the Bradford, the Venango, and the Pithole.

29 Q. Are you acquainted with all of those outside fields?

A. I have been in them all and worked in them all to a certain extent.

303 30 Q. You say you have had experience in the construction of natural-gas lines?

A. Yes, sir; I have.

31 Q. When were you first engaged in that work?

A. In 1876.

32 Q. Where?

A. That was in Venango county.

33 Q. On what line?

A. For Uncle Tom King, of Parker's Landing. It was an old line. There was no gas in it.

34 Q. When were you first engaged in the construction of gas lines?

A. In the Hickory field, into Pittsburgh. That was between 1881 and 1882.

35 Q. What line was that?

A. The Washington gas line. I am not sure about the date of that.

36 Q. What was the business of this company?

A. We started into Pittsburgh with a six inch and a five and five-eights inch line, all of one line, but the extension of the five and five-eights was six-inch.

37 Q. That was a line for the piping of natural gas into Pittsburgh, a distance of twenty-seven miles?

A. Yes, sir.

38 Q. State whether or not that was the first natural-gas line constructed in Pittsburgh?

A. I think that was the first natural-gas line for the mills. Spang, Chalphant & Co.'s was the first that went in there for manufacturers.

39 Q. What was the first natural-gas line constructed from the fields to Pittsburgh for the purpose of supplying mills?

A. That was the Washington, to the best of my knowledge. The Spang, Chalphant & Co. was used for the pipe mill also. Spang & Chalphant's was the first line that went into the old city of Pittsburgh.

40 Q. What was the first line constructed from the gas field to the city of Pittsburgh or to any of its suburbs?

A. That was the Spang & Chalphant Co.

41 Q. When was it constructed?

A. It was in 1876 or somewheres along there. It might have been '74.

42 Q. What was the size of that line?

A. Three or four inches; I couldn't tell now.

43 Q. What was its length?

A. Between seven and nine miles.

44 Q. From what field?

A. From the extension of the Butler field; between the Butler field and the Brush Creek field.

45 Q. What was the next line constructed to Pittsburgh?

A. The Washington, to the best of my knowledge, for mill purposes.

46 Q. Was that the one which you constructed by contract?

A. No, sir; I was assistant superintendent and constructor on it.

47 Q. And that is the five and five-eight- inch and six-inch line, twenty-seven miles long?

A. Yes, sir.

48 Q. To what field?

A. To the Hickory field.

49 Q. And in what county is that?

A. Washington county.

50 Q. What was the next line constructed?

A. I think Pugh & Emerson extended their line into the city; that was for domestic purposes.

51 Q. The Pugh & Emerson line, what size was that?

A. An eight-inch, I think.

304 52 Q. What was its length?

A. I couldn't tell exactly now.

53 Q. To what field did it extend?

A. It went to the Murrysville field, I think—eight or ten miles; perhaps more.

54 Q. And there the Murrysville; what was the next line?

A. The Philadelphia Company, I think.

55 Q. You may state how many lines there are from different fields supplying the city of Pittsburgh and its suburbs and its establishments at present, giving, if you can, with each its size and length and the field from which the gas it brings is piped from?

A. I don't believe I can do that.

56 Q. Give it as near as you can remember.

A. I don't know how many lines each company has. They have been laying so many lines this summer, it is hard to tell. The Philadelphia Company is the leading company of the city. They have a thirty-six-inch line, besides the other small lines. They have eight, ten, fourteen, and twenty-inch lines.

57 Q. About how many lines have they in all?

A. I couldn't answer that question; they have more than I know anything about.

58 Q. From what field do they pipe?

A. The Murrysville and Westmoreland, and also from the Hickory field. They operate the Chartiers Company's lines. A great many of the lines are under the control of the Philadelphia line, such as the Chartiers, the Pennsylvania, the Low Pressure, and several others that I don't remember their names.

59 Q. Have you given all that you now remember?

A. Then the Monongahela Gas Company has a thirty-six-inch line running from the Bellevernon field. I don't know how long it is; I might say it is forty miles, but I don't think it is that long; I think it is only twenty-eight miles. I never went up there only by the railroad, and don't know.

60 Q. What other lines?

A. The Equitable Gas Company has a thirty-six-inch line. W. D. Hartupee was the general manager and civil engineer of that line. He constructed it and also superintended it.

61 Q. Are there any other lines that you remember?

A. The Manufacturers' Gas Company's lines. I don't know the size of them. That is Charley Myron, of the Germania Bank. I don't know the length of their lines. There is a lot of other companies in there; I don't know anything about their lines.

62 Q. You may state whether any of these lines are laid by single concerns for their own purposes.

A. Yes, sir; Mr. Myron's is a people's company; the Pugh & Emerson is a people's company—it is called a people's company.

63 Q. I asked you whether private concerns laid their own lines to the field.

A. Anderson & Depew are laying their own lines now. That is a sixteen-inch line; it is for their own use. The Wittmeyer Company laid their own lines. George Chalfant, of the Etna Tube Works, and the Park Brothers have constructed their own lines. I don't know whether Jones & Laughlin have their lines or not.

64 Q. It is a fact, is it not, that a number of manufacturing
305 establishments have constructed their own lines to the natural-gas fields?

A. Yes, sir.

65 Q. State whether this work of constructing lines is going on all the time.

A. Yes, sir; it is. Anderson & Depew are laying their lines now, and it will not be done for a month, and also other parties. I have bid for several lines to be constructed.

66 Q. To what extent is natural gas used in the mills and manufacturing establishments in and about Pittsburgh?

A. They are all using it.

67 Q. What is the extent of the manufacturing interests at Pittsburgh as compared with other large cities of the country?

A. There are a great many manufacturing establishments there, and mills. I don't know of a city in the Union that has as many.

68 Q. What kind are they, mostly?

A. Mostly rolling-mills, iron manufactories, furnaces.

69 Q. What is the comparative consumption of gas by such establishments as compared with the ordinary domestic consumers?

A. It is very great, for the reason that in a mill it takes almost a thousand cubic feet of gas to compete with the heat of one bushel of coal, whereas for domestic purposes you have got no waste. It takes a thousand cubic feet, on the average, in the mill to make it do the work of one bushel of coal.

70 Q. In domestic consumption what is it?

A. One-half—five hundred cubic feet—will do it.

71 Q. Five hundred cubic feet, equal one bushel of coal?

A. Yes. We estimate in Pittsburgh two thousand cubic feet of gas to each family per day.

72 Q. Without regard to this loss that you have spoken of, I understand you to say that the gas consumed in the manufactories is very much in excess of the amount used by domestic consumers.

A. Yes, sir.

73 Q. Can you give any idea of the number of large establishments—rolling mills, pipe mills, and other large manufacturing establishments—in the city of Pittsburgh that are using gas?

A. I could give you some. I don't know whether I could give them all or not. They are too numerous to mention.

74 Q. Are you familiar with the rolling mill in the city of Toledo?

A. No, sir; I am not. If I knew how many bushels of coal they consumed in a day I would know about their size.

75 Q. Do you know what is the average daily consumption of the city of Pittsburgh and its suburbs?

A. It is between four hundred million and eight hundred million.

76 Q. Four to eight hundred million cubic feet daily?

A. Four to five in the summer and eight to nine hundred million cubic feet in the winter, because we have the grates all on.

77 Q. What part of that is domestic consumption?

A. I couldn't answer that question to answer it correctly, I know. I would think, though, in my judgment, that it would be about from one-sixth to two-sixths. I may be away off on that. I would not pretend to know anything about it.

306 78 Q. Can you tell the number of domestic consumers in the city of Pittsburgh, approximately?

A. No, sir; I can't.

79 Q. What is the population of the city?

A. I couldn't tell you that, exactly.

80 Q. It is true, is it not, Mr. Gentleman, that perhaps eighty to eighty-five per cent. of the gas consumed in Pittsburgh is consumed by manufacturing establishments?

A. I think so; yes, sir.

81 Q. Do you know what is the present cost per thousand cubic feet of the gas consumed by domestic consumers in Pittsburgh?

A. The Philadelphia Company is charging ten cents if paid in from the first to the tenth of the month, and twelve and a half cents thereafter, if it is not paid at that time. We started in at three and a half cents. We supplied J. Painter & Sons at three and a half cents per thousand.

82 Q. Your information is that the present price is less than that to mills and manufacturing establishments?

A. In 1886 I was general manager of the Washington line, and we were on about the same basis as when we went in with the line. I think it is more now.

83 Q. Do you mean it was less before?

A. Yes; it was less when we went in. We went in there at three and a half cents; it is more to-day, I know.

84 Q. How much more to-day?

A. They charge in the houses for private domestic use ten cents, and if the private consumers have got to pay ten cents per thousand by metre, the mills have got to do the same or they will shut the gas off; that is all there is about it.

85 Q. Is that the reason why these private enterprises are building their own lines into the fields?

A. I don't think there is any other reason. If I could buy gas from a line I would be foolish to go and spend two or three hundred thousand dollars to lay a line if I didn't think I could lay a line and bring it in there cheaper than they charged me.

86 Q. How does the quantity of gas supplied in the city of Pittsburgh and its suburbs compare with what it was five years ago?

A. The only thing I can take for that would be the Washington field and the other fields.

87 Q. I am speaking of the quantity supplied in the city without

reference to the field—the quantity consumed in the city as compared with what is was five years ago.

A. I suppose it is two-fifths more; it is three-fifths more to-day than it was five years ago; perhaps more. Five years would throw us back to 1884; yes, I am sure it is three-fifths more, anyway, because lots of mills hadn't it in then at all.

88 Q. What about the number of domestic consumers being increased in the same time?

A. They are about the same or a little more, say. A great many people were afraid to take it in at first and wouldn't have the gas after the Penn-street explosion; it scared a great many of them for a year or so; they are using it now—every person, to my knowledge, except a few people on the side of the hills, where they can get the line to them without additional expense.

307 89 Q. How many more domestic consumers would you say there are in Pittsburgh to-day than there were five years ago?

A. I would say there are as many again, anyway.

90 Q. There has been an increase of population in that time?

A. I can't answer that. There has been a big increase. I saw the census a few weeks ago, but I can't remember it, I am so forgetful, but it has increased a great deal, though.

91 Q. What is the extent and capacity of the field from which these pipe lines are drawing at the present time as compared with what it was five years ago?

A. Well, the Washington field has for the last four or five years been having ten or twelve lines going out of it to Wheeling, Steubenville, Wellsburg, Mingo, and Brilliant, and there are a great many other towns there that I can't name on the Royal Gas Company's line. Then also the Wheeling Natural Gas Companie's goes to the Washington field and the neighboring towns in the Hickory field, and the Natural Gas Company of West Virginia also. The Washington Heat and Light Gas Company goes into Washington and gets gas all the way into Washington and don't take a great deal out of the Hickory field. The Washington Natural Gas Company takes gas into Pittsburgh. The Chartiers Company and the Pennsylvania Company, operated by the Philadelphia Company, go into Pittsburgh.

92 Q. Do those all go from the Washington field?

A. Yes; there are ten or twelve eight and ten inch lines go from the Washington field.

93 Q. Are they building any new lines?

A. Not to my knowledge.

94 Q. How recently have lines been built into the Washington field?

A. I don't think there have been any built into that field since the Chartiers Company put their ten-inch line down.

95 Q. When was that?

A. In 1885 or 1886.

96 Q. State if all of these lines have been drawing from that field since that time.

A. Yes, sir; they have. The territory was all gathered in. No other lines could get any territory in there.

97 Q. About what is the size of the Washington field that you speak of?

A. It is so scattered I could hardly tell. It has Taylorstown, Washington—the Hickory and Cannonsburg district is all one. I don't know what the size would be.

98 Q. Can you estimate the number of square miles it covered?

A. I don't think it is over ten miles square, if it is that much.

99 Q. Would you say it was about ten miles long and ten miles wide?

A. No, sir; it is longer than it is wide. The field don't run over two miles wide.

100 Q. About what is the length, then?

A. It would be about fourteen miles.

101 Q. About fourteen miles long and about two miles wide, perhaps?

A. Yes.

102 Q. That would be twenty-eight square miles?

A. Yes; fourteen miles long and a mile and a half or so wide. It would be about ten square miles. I don't think all the gas field there would be more than ten square miles, because we have a good many bastards there, where we get no gas or oil, either.

103 Q. Then, as I understand your figures, you would say
308 that the entire field would not cover more than twenty-eight square miles?

A. I think not more than ten square miles of what would be good gas territory.

104 Q. What is the capacity of that field as compared with what it was five years ago, say?

A. The only thing I have to go by is that the companies are still there, and they don't get gas from any other territory, and they are still supplying their customers.

105 Q. Are they supplying the same number of consumers that they were five years ago?

A. To the best of my knowledge they are. I don't know of any difference. What one company loses the other company picks up. If one company loses its trade the Chartier's Company or some company is right there to pick it up from the same territory.

106 Q. How many wells were there connected with the Washington line when it was completed?

A. We had when the Washington line was completed—there was only two wells, but, of course, we drilled more wells.

107 Q. When you first commenced supplying consumers?

A. We had but one well—the old McGuggan well. I was not there at that time.

108 Q. What was the capacity of that well?

A. She was supposed to flow—she didn't flow over eleven million.

109 Q. How long was it that they supplied gas from that one well alone?

A. Alone? They were supplying, I think, only about four months or five months until they drilled other wells.

110 Q. Then they attached other wells?

A. Well, they supplied from one well until they got the other well done.

111 Q. When was the McGuggan well complete?

A. That was drilled by the Niagara Oil Company. I think it was in 1878 or 1879. I couldn't say positively.

112 Q. It was completed before the construction of the Washington line?

A. Yes; it was drilled by the Niagara Oil Company, and William Nelson laid the line. It blowed out against the hill for a long time.

113 Q. How long did it blow?

A. Several years, I think. I don't know exactly.

114 Q. You say it was attached to the line for about five months before the other wells were attached?

A. I think so; yes.

115 Q. Do you know whether the well is flowing now?

A. I think not.

116 Q. How long since it was flowing?

A. The 15th of November, 1887, she was flowing. When I left the line—when I resigned my position—it was still flowing.

117 Q. Do you know whether it is flowing now or not?

A. I do not. I think not.

118 Q. State whether it was used to its full capacity in connection with the line.

A. We used all of our wells with the wells wide open. We left them all wide open.

119 Q. You opened them wide in the line?

A. Yes, sir; we passed her through a separator. We didn't get her packed off right. We have several different sized pipes in her. We passed her through a large boiler or separator.

120 Q. How long was she used on the line, to your knowledge?

A. Six or seven years, to my knowledge—six years.

309 121 Q. She was still flowing when you left?

A. Yes, sir.

122 Q. She had been blowing off for several years before?

A. Yes, sir; for several years before.

122 Q. You may state how long the other wells which were connected with this line were used.

A. They were used straight ahead—the wells were used straight ahead—until I left the line. As fast as we drilled we turned them into the lines and left them going. I had two wells in progress when I left the line.

124 Q. How many wells were attached to the Washington line when you left?

A. We only had about five good producing wells. The rest were light, and we didn't use them.

125 Q. How long were those five attached to the line and used, to your knowledge?

A. I couldn't answer without having my books to see when they

were drilled in. They were drilled in one after the other as fast as we could.

126 Q. Approximately, about how many years?

A. From three to five years.

127 Q. Were they still flowing when you left?

A. Yes, sir; they were flowing right ahead.

128 Q. Are they still flowing now?

A. I think they are, to the best of my knowledge.

129 Q. Have you heard of their giving out?

A. No, sir.

130 Q. Are you still accustomed to going into that field?

A. Sometimes; yes.

131 Q. Are these same wells in that line now?

A. I can't answer that. They were the last time I was there, but they may have turned them out inside of a day.

132 Q. How many wells were connected with the Washington line when you left, in 1887?

A. There were six.

133 —. Can you state what was their aggregate capacity, about?

A. I don't think it was over fifteen million.

134 Q. Fifteen million daily?

A. Yes, sir.

135 Q. That is, the aggregate of the six wells?

A. Yes.

136 Q. Those were the same wells which you say continued to flow up to the time when you left?

A. Yes, sir; until the 15th of November, 1887. The superintendent on that line neglected to gather up territory, and the other companies surrounded them and they had poor territory to work on.

137 Q. About what quantity of gas was consumed on that line when you left, or about how many consumers did you have?

A. I don't know how many cubic feet we did put through the line. We had Painter & Sons' mills, and we had, perhaps, one hundred outside consumers.

138 Q. Any other mills?

A. No, sir; no other mills.

139 Q. These hundred other consumers—were they domestic consumers?

A. Yes, sir.

140 Q. Dwelling-houses, &c.?

A. Yes, sir.

141 Q. J. Painter & Sons' mill was a very large manufacturing establishment, though?

A. Yes, sir.

142 Q. State whether or not that was a large concern.

A. It is about as large a mill, I guess, as is in Pittsburgh, if not the largest.

310 143 Q. Can you tell the quantity of gas which that mill consumed daily?

A. I cannot. I don't recollect how many bushels of coal they used. If I knew that I could tell. We ran into Allegheny and

supplied the Allegheny Heating and Lighting Company for awhile, but not long.

144 Q. Did your failure to supply those consumers arise through the failure to secure gas in the field or on account of the size of your line?

A. On account of the size of our line. We went in with a five and five-eighths inch line with the expectation of supplying Pittsburgh, but we were badly disappointed.

145 Q. What do you know about the pressure at these wells in the Washington field now compared to what it was when you started to pipe gas?

A. I would have to go back for a starting point to 1887, in November, because since then I don't know anything about their gas territory. I have not been in it. For the wells I have just got the same as hearsay since 1887.

146 Q. I speak now of the time when you had personal knowledge of it. What was the pressure there in 1887 as compared with what it was when you went there and commenced piping the gas?

A. It was somewhat lighter. It kept up nicely until the nine companies got in there and got to punching so many holes in the ground; then it got the field down to about flowing capacity, and then there is no gas field will flow more than a certain quantity. If you get to taking more out than her flow is, then she will naturally go down to that stage and get a level all around.

147 Q. What was the pressure when you first drilled the wells in Washington field?

A. They measured the McGuggan well—that she was a seven-hundred-pound well. They told me that. I didn't measure it. That was in a three-inch pipe.

148 Q. What was the pressure on the first well of which you had personal knowledge of its measurement yourself?

A. That well was the first one. I measured it afterwards. When I measured the well she only had about three hundred and ninety-five to four hundred and fifty pounds.

149 Q. Is that the same well?

A. Yes, sir; that was about a year after they began to pipe her, too.

150 Q. Did you measure any wells which showed this high pressure of seven or eight hundred pounds?

A. No, sir; and I don't think there was ever one in the field that done it, either.

151 Q. I am speaking about when you first began to pipe the gas.

A. Yes, sir. I don't think there ever was one. The Eliza Carlyle well and the McKnight were the largest two wells struck in the Washington field. I think the Eliza Carlyle was about four hundred pounds. The McKnight was, I think, about the same. She was a Chartiers Company well.

152 Q. After these nine or ten companies were in there what was the effect upon the pressure?

A. They fetched the pressure down to two hundred and fifty or

three hundred pounds, and they are getting about that pressure to-day.

153 Q. Since the pressure reached that point what has been the pressure since that time up to the time you left?

A. It was about the same. The last wells I brought in were about the same.

311 154 Q. State whether the wells which had been flowing remained at the same pressure.

A. You couldn't notice any change on them at all.

155 Q. How many wells were there in that field that remained substantially the same pressure while you were there?

A. We didn't—all our wells—we didn't notice much of a decrease in all our wells. The wells were about the same when I came on the last time.

156 Q. When was that that you came on the last time?

A. I came on on the 15th day of February, 1886. That was the last time. I was on the line two or three different times. They sent for me, and I came on on the 15th day of February, 1886, and I was on there until the 15th day of November, 1887.

157 Q. During that time you may state whether there was any diminution in the pressure of the wells.

A. I didn't notice any of any kind. Some of the wells wasn't drilled deep enough into the sand, and I drilled them deeper and fetched them in. They were just about the same.

158 Q. What was the pressure upon the new wells drilled at that time?

A. They were just about the same. I fetched in the Aiken well. She was just about the same as the Carlyle well and the Johnson well.

159 Q. When these wells were first opened, in 1880 or 1881——

A. They started in about 1881, I think.

160 Q. The pressure was up to four and five hundred pounds in 1881?

A. No five hundred pounds. I never saw a well in the field five hundred pounds.

161 Q. What was the average pressure at that time?

A. Three hundred and fifty to four hundred. I never saw one over four hundred pounds. One was four hundred, but I don't recollect which one it was.

162 Q. How long did they run at that pressure?

A. I left the land in the spring of 1884, and I came back in February, 1886, again; and from the time I left until I came back they had dropped down—our wells—all the wells.

163 Q. How much?

A. From three hundred and fifty and four hundred to two hundred and fifty and three hundred.

164 Q. Then there was an average drop of about one hundred pounds—the pressure—during the time you were away?

A. Yes; I think so. There had been, at least, I suppose, one hundred wells drilled in the field in my absence, and maybe more.

165 Q. And from that time on, as I understand it, the wells have remained stationary?

A. Until I resigned they were about the same thing; yes, sir.

166 Q. How many wells were there in that Washington field that remained stationary?

A. I don't know how many wells. The Chartiers and the Wheeling Natural Gas Companies and the West Virginia has. They had their wells right around mine, and I had wells right through theirs, and I suppose their wells would be about the same. There would be at least seventy-five or one hundred wells.

167 Q. Within what radius were these wells?

A. Within about four miles, I guess, or five. They are pretty strict in Pennsylvania; you don't get nothing from them. They are just as likely to tell you there is a cow in a hole as gas. I think there are about seventy-five wells. If they don't properly
312 case a well and they leave water get in her, it is going to shorten her life and drown her out.

168 Q. I mean wells which were properly constructed and were used. Then, as I understand from your statement, there were from seventy-five to one hundred wells that have reached a pressure of two hundred and fifty pounds and remained stationary for——

A. Yes; for those eight months that I was there. I couldn't see any difference in any of our wells at all. One well in particular, the Joe Carlyle, when I went there it had only one hundred and twenty-five rock pressure and forty-five pounds minute pressure, and it was the same when I left. It was a pretty small well to pipe seven miles, but we had to do it.

169 Q. That is a very low pressure?

A. Yes, sir.

170 Q. That was run?

A. Yes, sir; I used it the whole eight months, and when I turned it off we noticed it very quick in the mill. They had to throw off several furnaces.

171 Q. These wells which you speak of as maintaining about two hundred and fifty, were they run wide open?

A. They were all wide open. No person in the East keeps their wells back, but Wittmeyer has a regulator in his well, but he will take that away before long, too.

172 Q. What is the fact, so far as you know, about the gas giving out in the gas field about Pittsburgh?

A. That is a question very hard to answer. I don't think it is giving out. The pressure has dropped down. If it was giving out they would not put in thirty-six-inch gas lines in it, persons who have been in the business seven or eight years.

173 Q. What is the fact about these gas wells giving out absolutely when they are properly drilled?

A. There is such a thing as a well corroding or paraffining a well. The well goes into the porous rock, and it shuts her up. I have known wells to shut up and you go a hundred feet away from the well and drill another hole and get a good gas well.

174 Q. That is, a gas well may be destroyed—may become dry—

and then you can go a distance of perhaps a hundred feet and get another?

A. Yes; they did that with No. 2 McGuggan from No. 1 McGuggan. They went one hundred feet on the northeast line and drilled another well.

175 Q. What kind of a well did they get?

A. They got a right good well. It was used until I resigned, and I suppose they are using it to-day.

176 Q. That was in 1887?

A. Yes, sir.

177 Q. When was it drilled?

A. It was drilled in 1884, I think.

178 Q. What was the cause of this first McGuggan well giving out?

A. She was not properly put down in the first place.

179 Q. Is that the well you spoke about having several different kinds of casing in it?

A. Yes, sir; four different kinds of casing in it, besides the drive pipe. They got a bad hole.

180 Q. What actually resulted from having five different-sized casings? What happened to the well? Did she get wet or go dry?

A. She got wet.

182 Q. Where did the water come from?

A. It came from the top sands.

313 183 Q. And drowned out the well?

A. Yes, sir; it came from the salt above the second pay streak in the second sand.

184 Q. Then, as I understand it, this well was drowned out by the water which came in from above and was permitted to go down into it?

A. Yes, sir.

185 Q. Did that affect the other well when it was drilled?

A. No, sir; it didn't seem to affect it at present, but after a while it drawed water from the other well right through; one bad well will spoil a whole field.

186 Q. What do you know about there being salt water in the gas sand or gas rock?

A. I don't know where it is. I have got small basins or pools of salt water that would exist for a few days. We often get a small pool of salt water and leave the wells blow and they will exhaust themselves, but I never got salt water in a gas well—in the gas sand.

187 Q. Did you ever hear of their getting salt water in the gas sand?

A. No, sir. They either broke through the crust in the dividing streak in the shale and got it from the second or third pay streak, or maybe from the Speechly—the lower sand. You get that in Armstrong county at 2,505 feet; that is the lowest sand that bears gas.

188 Q. That sand that you speak of is known sometimes as rock?

A. Yes; it is a rock.

189. And it is called sand?

A. Yes; it is solid rock.

190 Q. And this Speechly that you speak of is the lowest gas rock or sand?

A. Yes, sir.

191 Q. Below that what do you find?

A. Broken shales.

192 Q. What in the broken shale below the Speechly sand?

A. Nothing but broken slate and a mixture of yellow sand and pebbles, but mostly broken slate.

193 Q. Is there water in that?

A. Yes.

194 Q. Where does the water come from that gets into those gas wells?

A. Either from the bottom or top salt-water vein.

195 Q. Is there salt water below the Speechly?

A. No, sir; between the fourth pay streak and the Speechly. If you drill through, too deep through, the fourth pay streak or the fourth sand you will get salt water, and it will come into your well. Take the Butler field. We put four hundred feet of casing in that. First we put in the drying pipe thirty or forty feet, and that cases the first water off; next we put in four hundred and fifty feet, and that cases off the salt water above the first pay streak.

196 Q. The first pay streak is the first gas sand?

A. Yes; it don't amount to much. Then we go on down to the second sand; that don't amount to much. It is generally the lowest rock, with a good bit of salt water in it; and right below that is the second gas sand. Then you have got to pull your casing and recase down eleven hundred feet below the second streak of salt water. That is the last streak of salt water you get until you get down below the fourth sand.

197 Q. Then all of this water, both salt and fresh, comes from something else than the rock or sand in which is found the gas?

314 A. Yes; it comes from different strata. The salt water that we get in the gas sands is a foreign water; it comes from the bad holes, and one bad hole will spoil a whole territory.

198 Q. As I understand you, dry wells, for instance, or bad wells are drilled into the gas sand and then abandoned, and the salt water and the fresh water is allowed to flow down through these wells into the sand, and that makes wet gas wells?

A. Yes; that is what does it.

199 Q. Can you state what is the effect of completely casing off the water above the gas sand and then going through the gas sand without striking water below? Do you ever get water?

A. No, sir; but you may not get gas, either.

200 Q. When you get a dry well without gas do you get water in the sand?

A. No, sir; you don't.

201 Q. Is it true that the gas and oil and water lie in the form of cushions, as it were, in the gas sand itself?

A. No, sir.

202 Q. Is it true that after you strike the gas sand and draw out the gas that the water follows it up?

A. No, sir; not if the territory is dry. She is dead, and that is all there is of it; but if your easing is bad your well will get wet quicker closed in tight than when she is flowing. The water will run down the wall of a gas well the same as steam will run in a steam pipe. If you have a steam pipe with a hundred pounds of steam in it and it is choked off the condensed water will run down into the boilers. If you close a gas well in the least bit wet and leave it a month and go back she is as wet as can be; the water runs down the wall.

203 Q. Does the water accumulate from the water in the gas sand or come from above?

A. It leaks through the casing and sometimes through the joints. I have had a casing pulled out fifteen times before I could get it tight.

204 Q. Where that happens what is the effect of blowing the well? Does it get dry again?

A. Yes. In one particular territory I had to blow the wells out every Sunday to keep them dry.

205 Q. Do they become perfectly dry again?

A. Yes; to a certain extent they get dry.

205½ Q. What is the depth of the wells in these fields?

A. In the Washington field 2,240 and along there; their variation is something. The Butler field is 1,100 to 1,600, and the different territories run between them.

206 Q. Then they run from 1,100 to 2,200 in the different fields?

A. Yes, sir.

207 Q. Why is this?

A. You get here above the limestone; we start from the limestone. If it is 250 feet from the top of a hill to the limestone you are up on the top of a hill and I am in the bottom. I am right on the limestone and have two hundred and fifty feet less to drill.

208 Q. Where are the best gas wells found—on the anticlinal or the synclinal?

A. On the anticlinal.

209 Q. What is the depth of the anticlinal?

A. The average depth is thirteen feet to the mile in the anticlinal. I have known it already to be 20, but never over that.

315 210 Q. Where is the summit?

A. The summit of the anticlinal? Do you want the summit of a certain anticlinal?

211 Q. I speak of the field near Pittsburgh, say the Bradford field.

A. The summit of the Bradysburg anticlinal would be about Golden City. Golden City seems to stand right in the centre.

212 Q. The dip appears to be in each direction from Brady City.

A. Yes, sir.

213 Q. And the average dip is about 13 or 14 feet to the mile?

A. Yes, sir.

214 Q. Is it true that the gas is found at the summit of the anticlinal only?

A. No, sir.

215 Q. Is it true that it is confined there as in a reservoir at the top of the anticlinal?

A. No, sir; it is not. If it was confined to the top of the anticlinal and I would go down to the foot of the anticlinal, on the synclinal, I would get nothing but salt water, but you can go clear down to the base of the anticlinal and get gas.

216 Q. Will you there find regularity in the strata?

A. Yes. If I started at the Brady's Bend and I drill on the summit I get gas, and I come on down to Butler on the same anticlinal—twenty-five or thirty miles—and I would be 28 or 30 times thirteen lower than I would be at Brady's, and I would most surely get salt water as soon as I broke the sand; but I could case it properly in the dividing shale between the two sands and go plumb through it and get the same gas sand and the same thickness in the sand. If there is any variation it is in the bottom of the sand. Sometimes it will be hove up, and then the dividing streak will be thicker.

217 Q. What variation, is there in the depth at which you find that?

A. I have seen it ten feet or fifteen feet. I never saw it over fifteen feet—the red rock lifted up into the second sand.

218 Q. I speak of the depth at which you strike the top from the top of the limestone.

A. There is no variation, with the exception of the thirteen to twenty feet—generally thirteen feet, unless you strike a little dip in the limestone.

218 Q. Aside from the thirteen-feet dip you find no variation, with the exception of the dip, in the depth at which you strike the top of the sand?

A. No, sir.

219 Q. Is it true that where a well is properly cased and the gas exhausts in the well that the salt water follows it up?

A. No, sir; I never knew such a case. I have had salt water come down and drop down in the well and the gas shove it up until the well was fixed. I have also pulled the casing, before the laws of Pennsylvania prohibited us from doing that, and let the salt water go down.

220 Q. What are these plugs which are used when a well is abandoned?

A. One pine plug is supposed to be put right in the bottom of the last pay streak in the fourth sand. It is to keep the salt water from getting from the dividing streak below the sand up into the gas sand. The other is to be put right at the top of the pay streak, and that is to keep the salt water from the dividing streak be-
316 tween the third and fourth sand from getting down to the fourth pay streak. You ought to put another block at the bottom of the third sand and another one at the top of the third, but they don't do it. That is to keep the salt water from getting from the dividing streaks into the sand. You are also supposed to put a plug at the top of the third sand to keep the salt water from getting up into the fresh water or into the limestone.

221 Q. Where these wells are abandoned are they ever cased off in the gas sand itself?

A. No, sir.

222 Q. Why not?

A. The casing sits right onto the gas sand.

223 Q. But where the casing is drawn?

A. Where you pull the casing out?

224 Q. Yes. Are any plugs first put in, or is the gas sand cased off or plugged in any way?

A. Yes; it is done by a great many to keep the salt water from getting down.

225 Q. Do you plug up the gas sand itself or plug above and below?

A. Above and below, to keep the salt water out of the gas sand.

226 Q. Do you ever plug up the gas sand itself?

A. No, sir; it is not necessary.

227 Q. Then there is no water in the gas sand itself?

A. No, sir. If there were there would be no use of putting in plugs at all. They are put in to keep the salt water out of the pay streak.

228 Q. Referring, for the purposes of illustration, to the map which is shown you, will you state, supposing the red line A, B, and C to indicate the anticlinal—you may state where gas is found on the points between A and B and A and C, supposing the red line to indicate the gas rock or sand.

A. We would have to find it anywhere from A to B or A to C. If we didn't, and this (A) was Brady's Bend up here, when we got down to Pittsburgh (B) we would have no gas.

229 Q. Is it true that gas lies in the summit of the anticlinal, with a belt of oil or salt water below, and as for instance the line "X Y" on the map?

A. No, sir.

230 Q. How do you know that that is not the fact?

A. Because I have drilled all over it and had wells drilled all over it.

231 Q. And is it true that where a well is drilled at the summit and then one drilled further down the anticlinal that the second well is overcome by salt water and in the course of time the first is likewise overcome?

A. No, sir; the distances have nothing to do with it. If I get the gas in the anticlinal it is a very good thing, and if I get it in the centiclinal (synclinal) it is the same; but I have drilled in the centiclinal and the anticlinal both and got neither gas, oil, nor salt water. I got a dry hole. You have sometimes to haul water to drill through into the gas rock all the time. I have pumped it two thousand feet up the hill to drill in the Kelly Station district. We got the same sands on the centiclinal as we do on the anticlinal, but we get gas less often on the centiclinal than we do on the anticlinal.

232 Q. You spoke this morning of the Chartiers Gas Company. Do you know whether Mr. Hartupee was formerly connected with thatcompany?

317 A. Mr. Hartupee was general manager of that company and Mr. Tate was superintendent.

233 Q. When was Mr. Hartupee general manager?

A. He constructed the line. He was the manager of the line up to the consolidation with the Philadelphia Company.

234 Q. About what length of time was that?

A. I think they went into Pittsburgh in or about 1883. I think it was in 1883 or the latter part of 1882; and he was superintendent up to—I think the consolidation took place about 1887.

235 Q. What territory has the Chartiers Company been drawing from?

A. They get their gas in the Washington field.

236 Q. State whether they have been getting their gas in the same field all the time ever since it was constructed.

A. Yes, sir; they have. I think they have intersected with the Philadelphia in the city, but at the same time they are getting their gas from the Washington field straight ahead.

237 Q. Have they been doing that ever since the line was constructed?

A. Yes, sir; to the best of my knowledge they have.

238 Q. And the wells connected with that line are the same wells of which you spoke this morning, are they?

A. Yes, sir; they had the best territory there. They had better territory than we have. They owned the McKnight well. I think the McKnight well is flowing yet. I couldn't say positively.

239 Q. How long has that been flowing, to your knowledge?

A. I think they drilled that well in 1883.

240 Q. How long was it flowing, to your knowledge?

A. It was flowing up to 1887 yet.

241 Q. Have you ever heard of its giving out?

A. No, sir; I have not. It is a good well.

241½ Q. Have any of these lines from the fields to the city, in Western Pennsylvania, ever been taken up or abandoned, to your knowledge, on account of the lack of the supply of gas?

A. No, sir.

242 Q. You say the small pipes have been taken up on these lines. Have they?

A. Yes, sir.

243 Q. Do you know of any line where the pipes have been taken up and the line abandoned?

A. No, sir; I don't know.

244 Q. What has been done when these small pipes have been taken up?

A. They laid larger. They first laid twenty-inch, and now they have got a thirty-six inch conduit line.

245 Q. Are these larger lines low pressure or high pressure?

A. They are supposed to be high pressure to the city limits.

246 Q. These large-sized lines that are laid of cast iron, are they low pressure or high pressure?

A. It depends altogether where they are located. If in the country

they are low-pressure lines. For instance, the Oliver Brothers and Philipps—they are high-pressure lines.

247 Q. What is the reason, if you know, that they take up these smaller pipes and put down larger ones?

A. They can't get gas enough through the small pipes.
318 They must have a larger pipe. It is impossible to flow the gas through the smaller pipe that they need.

248 Q. Is the increased size rendered necessary by a decrease in the supply or the increase of the consumption?

A. It is necessary in both; it is necessary, in fact, at the same pressure or the pressure at the wells; it is, anyway, necessary to get the gas through the lines.

249 Q. Is this increase of size of the line due to the failure of the field or due to the increase of consumption?

A. I think not; it is due to the increase of consumption.

250 Q. What is the pressure in the field now as compared with what it has been within the past two years, say?

A. About the same, I think, with a very slight decrease.

251 Q. Within what time has the great bulk of this change been made—that is, this change in taking up the small pipes and putting in larger?

A. Last summer and this summer—this summer in particular—there has been more of it done than at any other time.

252 Q. Has there been any marked diminution in the capacity of the wells in those fields within the past year?

A. I can't answer that.

253 Q. Has there, to your knowledge?

A. No, sir; not to my knowledge. I have not been in the Murrysville nor the Washington fields—that is, connected with the fields—for the last year back. I have been in the Butler field.

254 Q. Has there been any marked diminution in any of the fields with which you are acquainted in the past year?

A. There has been a slight diminution.

255 Q. Has there been any marked diminution—more than there was in the years preceding, past?

A. No, sir; about the same.

256 Q. Then what would you say, from your knowledge of the gas business and the number of lines that are being constructed and the amount of capital that has been invested and all the other facts that have come to your knowledge, as to whether this is a particularly hazardous or speculative or uncertain business?

A. I don't think there is any uncertainty about it. If a man has got a gas line and the territory that is all that is necessary. The Philadelphia Company has been paying twelve per cent. dividends since they started that I know of. They have continued to do the same, and they are also building these large lines.

257 Q. Were you connected with the Washington Company when it started?

A. Yes.

258 Q. Were you familiar with the earnings and the income and

the expenditures of that company in order to begin the supplying of gas?

A. Yes, sir.

259 Q. What was the capital invested in that company?

A. The capital stock was $250,000—that is, when I was superintendent. They started in with a five and five-eighths inch line. I don't know what their capital was with that; I think about $100,000.

260 Q. What was the total amount of capital invested up to the time that you ceased to be superintendent?

A. $250,000.

319 261 Q. Do you know what the income of the property was taken from that investment?

A. It was from four to five thousand dollars a month.

262 Q. Do you know what the expenses were of operating the line and maintaining the field?

A. My pay-roll ran about four to seven hundred dollars—that is, outside of the drilling or anything of that kind. Of course that wasn't counted into the expense.

263 Q. Do you know what the dividend was that was paid on that investment while you were there?

A. They didn't pay a public dividend. Captain Ford and Billy Nelson were interested in it, and they fixed it up in some way that I didn't know anything about.

264 Q. You are familiar with the cost of a line, are you?

A. Yes, sir; I am.

265 Q. I believe you said you had yourself constructed several lines as contractor?

A. Yes, sir.

266 Q. And had superintended the construction of others?

A. Yes, sir. I was general manager of the Ford City line and built everything there.

267 Q. Will you tell us what would be the cost of a line ten and twelve inches in diameter about thirty-three to thirty-five miles long, with an average haul of, say, three miles?

A. Wrought or cast?

268 Q. Wrought.

A. The ten (inch) would cost you about eighteen and a half cents per lineal foot for the labor, the constructing cost. The twelve and a half inch would cost you about nineteen and three-quarters or twenty cents per lineal foot.

269 Q. This cost, I understand you, is the entire cost for the hauling and laying of the pipe and constructing the line ready to receive the gas?

A. Yes, sir.

270 Q. And applies only to the main line, as I understand it?

A. Yes, sir.

271 Q. Would that cover the entire cost of construction for the main line?

A. We are doing it for the same to-day, and I make a living at it.

272 Q. Would there be any difference in the cost of constructing a line through a country such as that surrounding Pittsburgh and that surrounding Toledo?

A. Yes, sir; I think there would. You see we can only haul there a certain amount on account of the hills. We can only haul six joints of eight-inch pipe over those hills, where we could haul here twelve or fourteen joints, with a good team, making a difference of, say, one cent to one and a half or two cents a foot—from a cent to two cents a foot.

273 Q. What would be the cost of laying up and down the hills as compared with a perfectly level country?

A. That would be about the same thing, too. That would amount to at least one cent a foot.

274 Q. What would be the cost of pipe for ten and twelve inch wrought-iron screw-joint pipe?

A. I am not perfectly familiar with the quotations on pipe now, although the last ten-inch pipe, I think, was $1.35 per foot—stove-end Allison pipe. The twelve-inch was, I think, $1.45 or $1.50. That was last summer, 1889. Mine, up to the first day of April,
320 was 28 cents for five and five-eighths casing; but you can't go much on prices, because, with the fluctuation of the market, you can hardly tell anything about it.

275 Q. Does your estimate of the cost of laying pipe include the cost of laying and distributing pipe in the streets of the city that you have given here?

A. No, sir; it is the main line. That is all that was asked.

276 Q. What would be the cost of laying ten and twelve inch pipe in the streets of the city?

A. Ten and twelve inch—it would cost, perhaps—well, you could just add five cents a foot to it. You can handle it just as fast in the city as in the country, with the exception that the trenching in the cobble would delay you and cost five cents more; it would cost twenty-three to twenty-five cents in the city, ten and twelve inch.

277 Q. What would be the cost of smaller pipe?

A. Smaller pipe don't run up very fast, but how small?

278 Q. Say from four inches up to ten.

A. A four-inch pipe you can lay for from nine to eleven cents.

279 Q. Take six and seven inch.

A. You can lay six-inch about as cheap as you can four. You have got to dig the trench anyway, and trenches are what cost money. The eight-inch would cost you about thirteen or fourteen cents, or fourteen and a half, anyway.

280 Q. Does that include the cost of removing and replacing the pavement and doing such work in the city?

A. Well, no; it costs eighteen and a half to nineteen and a quarter for eight-inch pipe to lay it in the city here, excepting where there is asphalt streets, and there you couldn't do it for a great deal more. We are bothered a great deal in cities with the piping, but you wouldn't be bothered so much here. In the city of Pittsburgh there is a regular net-work of pipes there.

281 Q. I will ask you if it occasionally happens, within your

knowledge, that where a gas well is sunk and it turns out to be dry that other wells are drilled close to it which supply gas.

A. Yes, sir; I have seen it.

282 Q. How do you account for that?

A. You get into a core of close sand. You have got to get out of the core of close sand and get into the loose sand—into the pebble rock.

283 Q. In other words, the gas rock or sand is close at certain points and the gas will not permeate through it?

A. No, sir; the McCarl well we drilled about five hundred feet from the Wheeling Gas Company's wells, which were good, and we didn't get anything; on the other hand, we had the McGuggan well drilled south and the Johnson well east, and they were good; then there were four or five wells operated by the Chartiers Company between them.

284 Q. And they were all good wells, as I understand you, and this one was dry?

A. Yes, sir.

321 Cross-examination by Mr. SCOTT:

1 Q. How long has it been since you were actually engaged in what is known as the Pittsburgh field?

A. Well, actually engaged—I might say I was actually engaged, with the exception of about two or three years, since 1876.

2 Q. I mean how long since you have left that field.

A. I only completed a line in the week before last—for which I have not got my money—to the Butler field, into Pittsburgh.

3 Q. You are, then, still engaged in that field?

A. Yes, sir; I am still at present engaged in that field.

4 Q. Have you had any experience in the Ohio gas fields?

A. Some; not a great deal.

5 Q. What experience have you had in the Ohio fields, and where?

A. I have gauged for the Sun Oil Line Company for about two months in the Wood county field.

6 Q. You were engaged for the oil company?

A. Yes, sir.

7 Q. When was that?

A. That was in August and September, I think, of this year.

8 Q. Have you been here continually since that time?

A. No, sir; I have not.

9 Q. Have you been in the employ of any of the gas companies in this field?

A. No, sir.

10 Q. Have you done any work, contracting or otherwise, in the boring for and construction of gas wells in this field?

A. No, sir.

11 Q. Have you had any experience in gas in the Ohio field?

A. Well, no, sir; not particularly. I have been around the wells

12 Q. All the experience you have had in Ohio has been confined to gauging for some oil company in there?

A. Yes, sir.

13 Q. Where is your present home?

A. At Freeport, Armstrong county, Pa.

14 Q. How far is Freeport from Pittsburgh?

A. It is 28 miles—that is, my home. I am in Pittsburgh most every day.

15 Q. You have been engaged, then, recently in the construction of gas lines into Pittsburgh?

A. Yes, sir.

16 Q. What gas line have you been constructing there recently?

A. The American Natural Gas Company's line.

17 Q. Where is it constructed from and to where?

A. It is constructed from the Butler field—an extension of the Butler field—to the Wittmeyer Brick Co.

18 Q. Where is the Whittmeyer Brick Company located?

A. On the Pittsburgh & Western road.

19 Q. How near to Pittsburgh?

A. About six miles.

20 Q. Is the line that you have been constructing constructed especially to supply that brick-yard?

A. No, sir; it is constructed for the supply of the townships of Richmond, Hempton, West Deer, Indiana, O'Hara, Shaler,
322 Hammer, Burrows, of Etna, Sharpsburg, Millerville, and their charter calls for Pittsburgh and Allegheny, but I guess they will never get there.

21 Q. I notice that you are reading these names from a memorandum. Is that taken from the charter of the company?

A. Yes, sir; that is from the charter of the company. I merely took that out. I didn't remember those names until I had something of that kind.

22 Q. Did the line that you built reach all these townships?

A. It went through all the townships, but didn't reach all the towns. They have been extending it. They couldn't get pipe this fall.

23 Q. What is the size of the line you were building?

A. Only five and five-eighths.

24 Q. Would a five and five-eighths pipe furnish all these townships with natural gas?

A. It would furnish all the townships that they run through and the little towns in them; yes, sir. They run through Elfinville, Behaven, Undercliff, Glenshaw, and other little towns.

25 Q. You mentioned "townships." You don't mean by that towns or villages or hamlets, do you?

A. I meant all the population in the immediate vicinity of the line.

26 Q. Is that a country population?

A. Yes; it is a country population.

27 Q. How many different natural-gas companies now enter Pittsburgh and the towns in the immediate vicinity of Pittsburgh?

A. I can't answer that. In the immediate vicinity of Pittsburgh I should suppose there were twenty-five or thirty. I couldn't name them.

28 Q. By the towns in the immediate vicinity of Pittsburgh I mean those towns and cities lying right adjacent to Pittsburgh.

A. I would have to run over them all to tell. In the city of Pittsburgh and Alleghany, if you mean, there is not that many gas companies in there; there are about twenty-two or twenty-three.

29 Q. Do you call Shady City a part of Pittsburgh, and all those towns?

A. Yes.

30 Q. You spoke in your direct examination of a great many lines being recently laid into Pittsburgh. Has there been a large increase in the number of gas lines brought into Pittsburgh recently?

A. There has been an increase in the large-sized gas lines in the last summer; more than at any other time.

31 Q. Has there not been a large increase in the number of lines within the last two or three years?

A. Well, there has been some increase. I don't know how large you might call it. There have been five or six independent companies run their own lines in within the last couple of years.

32 Q. What is the usual size of the lines now being constructed in and about Pittsburgh—trunk or main lines?

A. Thirty-six inch.

33 Q. What are they constructed of, pipe of so large dimensions?

A. It is necessary to construct them that large for to get the gas into the city. It is impossible to flow gas through a small pipe as cheap as a large pipe. The Philadelphia company had six or eight or ten lines down where one single line would answer.

323 34 Q. Then those companies who had smaller lines, of eight to twelve inches, had a number of them to furnish the flow to their customers?

A. Yes, sir; the Philadelphia has pulled up six, I think, at Hoboken and put larger ones down.

35 Q. Pulled up those of their old lines and put down ones of larger diameter?

A. Yes, sir.

36 Q. How long has it been since they put down the smaller lines which they are now taking up?

A. Some of them have been down a good while; some of them—the most of them—have been down since 1883 or 1884.

37 Q. Has it not been found impracticable to successfully operate a gas line for any distance with pipes of twelve inches or smaller?

A. It is altogether according to the population or the size of the city and the demand at the other end of the line. You can't put a ten or twelve inch line into Pittsburgh for the whole trade or a twenty-inch line, either. If you want to get the trade you must put in a larger line. That is the aim of the companies in laying larger lines. It is impossible to get the gas through in the smaller lines.

38 Q. How does the consumption of gas now in Pittsburgh compare with its consumption one year ago?

A. I think it is larger, because the plumbers are all busy all the time fitting up houses and putting on domestic consumption. It is more every day; the mills there not so much more than they have been, because the last year there has not been very many but what has been using it. All the mills in Pittsburgh have been on for three years back—you know that—but the houses refused to take it—many of them—on account of that Penn street explosion.

39 Q. Are all the large mills in Pittsburgh using natural gas?

A. I don't know of any that ain't.

40 Q. You have not heard of any who have abandoned the use of natural gas and returned to the old fuel?

A. No, sir; I have not. I have seen some cases in the newspapers, but I have failed to see any of the mills do it at all yet.

41 Q. In your direct examination you spoke of new lines being laid all the time. I will ask you why this is done.

A. Here is one reason why: Take the Park Brothers, for instance. They want their own gas line, and therefore they lay their own gas line. Anderson, Depew & Co. want their own line. They are paying too much to the Bridgewater Company's line, and that is the reason why there were ten and twelve and sixteen inch lines laid merely.

42 Q. What is the general market price of natural gas in Pittsburgh?

A. The Philadelphia Company, I suppose they charge ten cents a thousand.

43 Q. For domestic use?

A. Yes, sir.

44 Q. Do they charge the same to the manufacturers?

A. They get a percentage according to the size of the mills, which you nor I couldn't find out if we went there a dozen times. If the mill is large they get a percentage different.

45 Q. To the manufacturers the price is based on ten cents a thousand, with a reduction based upon the amount of use?

A. I think so; yes, sir.

46 Q. What is the corporate name of the Washington line
324 that you spoke of in your direct examination?

A. That is the Washington Natural Gas Company's line. It was consolidated with the Royal. It was incorporated as the Washington Natural Gas Company. That was its charter.

47 Q. What portion or proportion, rather, of Pittsburg did this company supply with natural gas?

A. We only supplied parties along Independent street and J. Painter & Sons' mills.

48 Q. Then you supplied J. Painter & Sons' mills and probably a hundred domestic consumers?

A. Yes, sir. We did have on the salt works and also the glass works, but we fell out with them. They didn't want to pay us what we asked and we choked them off.

49 Q. Did you sell gas to those mills by the foot or by some other mode of measurement?

A. We took the iron manufactured in a month and went on the basis of three and a half cents per bushel. It takes so many bushels of coal to make a ton of muck iron, or so many bushels to make a ton of scrap iron.

50 Q. How many bushels of coal are there in a ton, ordinary measurement?

A. Twenty-eight bushels; somewhere along there. There would be twenty-eight bushels to a gross ton.

51 Q. You spoke of Wittmeyer having a regulator on his gas well and said that he would take it away soon, you thought. Why do you think he will take away the regulator?

A. Because the change at the factory will not permit him to keep it there. He has a five and five-eighths line and the well is distant seven miles. You open all the kilns at one time and turn the gas on. If you want only one kiln there is only so much gas coming through the regulator at the well, and if you slip on all the kilns and need them all, it takes so long to get the regulators to work and to get the amount of gas along it will not allow him to keep it there. He must have so much gas at the works and there is so much friction—too much to get it to the factory.

52 Q. Suppose the well delivered an exact number of feet at the mouth of the well at the distance of ten miles from there, would an ordinary pipe of ten or twelve inches deliver the same amount of gas there as it did at the well?

A. No, sir.

53 Q. How do you account for that?

A. You lose thirteen pounds to the mile for friction—from eleven to thirteen pounds by friction. It is impossible to get over that.

54 Q. There is a retarding, then, of force of thirteen pounds to the mile in a twelve-inch pipe?

A. In the flowing capacity of the well; yes, sir. You take a bulkhead at the well and take a measurement there and you have got forty pounds at the bulkhead, and say five miles distant you have got your factory. If you have got a telescope line, I have had only two pounds difference between the Kelly Station district and Ford City glass factory, and that has run for ten days now.

55 Q. What do you mean by a telescope line?

A. A telescope line is a line beginning at the exit larger and decreasing in size as you go towards the well, or, rather, commencing at the well with a small size and increasing as you go to the factory.

325 56 Q. Have you ever made geology a study?

A. No, sir; nothing more than any gas man does. If I wanted any information in regard to a field to-day I would go to a driller and a tool-dresser every time before I would go to a geological man.

57 Q. You spoke of the Chartiers Gas Company. Does it draw its supply from the Washington field?

A. Yes, sir.

58 Q. Do you know how many lines it has into Pittsburgh?

A. Two ten-inch lines from the Washington field in 1887; they might have another since for what I know.

59 Q. Do you know what portion of Pittsburgh that company supplies with gas?

A. That went up on the south side; they supply along Main street and the west end for domestic purposes. The Philadelphia is in there, too; it is all the same, though they went on up the south side and took in Oliver Bros. and others until they got to their own mills.

60 Q. Can you estimate that fractional part of Pittsburgh they supply?

A. No, sir; I could hardly say that.

61 Q. Do they supply one-half of it?

A. No, sir; they wouldn't supply one-half if they supplied the whole south side.

62 Q. Could you estimate it in fractions?

A. I don't think they could supply more than one-fifth.

63 Q. Of entire Pittsburgh?

A. No, sir; hardly that. I don't think more than about one-eighth of it. Pittsburgh is a good-sized place, and it takes a good many million feet of gas to supply it.

64 Q. Do you know the rock pressure in the several fields about Pittsburgh as it now is?

A. At the present day I don't know exactly through my own eyes, and, of course, I would have only hearsay at the present day.

65 Q. You may give that.

A. I understand it is still two hundred and fifty to three hundred and fifty pounds in the Washington field and at the Murrysville field about the same, I understand. In the Butler field it is three hundred and fifty to four hundred. If you get into the pay streak you get about the basis for rock pressure.

66 Q. How does the pay streak compare with the time when the gas was first found?

A. There is a slight diminution all over the territory.

67 Q. Did you ever know a gas well which under continual drain didn't show a diminution of supply?

A. To a certain extent I never did. I never knew a well that didn't drop off gradually until she got down to a certain basis, and I have known them to run eight months on that basis.

63 Q. What happened after the eight months?

A. I don't know enough about the territory and I didn't stay long enough to find out. I think they are using the same wells to-day, though.

69 Q. You have known wells under continual drainage to maintain their supply for eight months continuously?

A. Yes, sir.

70 Q. And that is the longest you have known?

A. Yes, sir.

71 Q. You don't know what has happened since then?

A. No, sir.

326 72 Q. Please mention some wells that have maintained their supply under continual drainage, for eight months?

A. The Eliza Carlyle, in the Hickory district, is one and the Joe Carlyle is another. She was light when we struck her, but she didn't get any weaker for a year after we started; the Johnson well and the Simpson well. The Simpson well increased. These are all in the Hickory district, in the Washington field; those wells are about the same. The Simpson well increased to a certain extent, but the cause of that was in the territory, something in the territory that no person knows exactly, but it increased seven pounds in a month.

73 Q. Is that the only well you have ever known to increase?

A. No, sir; No. 2 Quigley well increased and gained thirteen pounds in twenty-four days. That was the Quigley No. 2, in the Kelley Station district.

74 Q. The wells you have given can be identified by those names which you have given?

A. Yes, sir; you find them all there. What they are to-day I don't know.

75 Q. You are not able to say what the conditions of those wells are to-day?

A. No, sir; I am not.

76 Q. You spoke of having some property interests in some of these lines. Are you a stockholder in any of the lines you have mentioned?

A. No, sir; I spent some money in the business in Duquesne county, but I have no money to put into the business. If I had, I don't know but what I would go into business of my own.

77 Q. You have no moneyed interest in any natural-gas enterprise?

A. No, sir.

78 Q. You spoke of the McKnight well. Where is that located?

A. In the Hickory field.

79 Q. And is known as the McKnight well?

A. Yes, sir.

80 Q. How did it compare with other gas wells in and about Pittsburgh?

A. It was about as good a well as ever was struck around there. The old Haymaker was a mighty good well. The McGuggan well would have been the largest well if it hadn't been for the small pipe that was put in. She was choked off with the small pipe.

81 Q. And the McKnight well is located where?

A. Between Hickory and Washington.

82 Q. And it was among the best wells which were found in and about Pittsburgh?

A. Yes, sir.

83 Q. Do you recollect when that was drilled in?

A. I don't; I can't say. I think it was in 1883, though.

84 Q. Do you know whether it is flowing now or not?

A. I can't tell that; I think she is, though.

85 Q. Did you ever hear or know of any diminution in the supply of that well?

A. I have never heard or knew of any; no sir.

Re-examination:

1 Q. You spoke of the Haymaker well. How long have you known that well?

A. Indeed, I don't recollect when that well was struck, but I think it was in 1883, too, that that well was struck. It was in 1884, and I think she is flowing yet.

2 Q. Where is the Haymaker located?

A. In the Murrysville field.

3 Q. Have you known it ever since?

A. Yes, sir.

327 4 Q. Is it still flowing?

A. I think it is.

5 Q. Was when you last heard of it?

A. Yes, sir.

6 Q. How long have you known of gas wells flowing in the Pittsburgh field?

A. Well, I have known by hearsay for thirteen years, but of my own knowledge I have known them seven years—that is, the No. 2 McGuggan; it is seven years since she was drilled, and if she is flowing this last year she has been flowing seven years. There is no reason why she ain't flowing. She was all right when I left her, the 15th of November, 1887. She was standing about the same as she was when I went on eight months before, with a very slight diminution.

7 Q. That is one of the wells which you speak of as being about stationary?

A. Yes; it didn't change in the rock pressure a great deal, but as they pulled at the other end of the line it decreased the pressure at the wells. If we were accustomed to carry two hundred pounds at the well and they pull very heavy on the other end of the line they run us down to forty-five pounds, and the rock pressure had a slight diminution each year.

8 Q. What I want to know is how long the gas wells have been flowing continuously down in the Pittsburgh field since the first one was struck.

A. They have been flowing at the Hickory field since—I think the McGuggan well was drilled in 1879, and they have been flowing right straight ahead since 1879.

9 Q. In the Hickory field?

A. Yes, sir; I think it was '79 that the McGuggan well was drilled; it might have been '78.

10 Q. How long have the wells been flowing down in the field, whether you drilled them or not?

A. Our wells was the first wells there.

11 Q. I am speaking of the Western Pennsylvania field, the whole field there?

A. We go up into McCain county and around Bradford there; it is away back in 1870. There has been gas wells there since '70, but I have not been around them, and I couldn't say anything about it.

12 Q. I want to know how long it is since that Western Pennsylvania territory has been producing gas.

A. Away back in 1876 I remember we got a very large gas well on the northeast side of David and Summit City, in Venango county, and there was a very large gas well, which blowed for a long time. I don't know but she is blowing to-day yet.

13 Q. Going back of 1876, how long before that was gas discovered there?

A. Father has told me of wells away back that old man—I forget his name—drilled with a spring-pole and got marsh gas down a very few hundred feet. That didn't amount to much; but anything beyond that I don't know.

(The further taking of depositions in this case is adjourned to Friday, November 22, 1889, at the same place, at the hour of ten a. m.)

328 FRIDAY, *Nov.* 22, 1889.

The further taking of testimony under notice continued as follows:

Present, representing complainants: A. W. Scott, Esq.
" representing defendants: Clarence Brown, Esq.

EDWARD ORTON, being called for further cross-examination, deposes and says:

Recross-examination by Mr. BROWN:

1 Q. You have heretofore testified in this same case, have you—known as the Toledo Natural Gas case?

A. Yes, sir.

2 Q. I desire now, in accordance with an arrangement at that time made, to somewhat further examine you on the subjects concerning which you testified at that time. You have stated, I believe, that you are professor of geology in the State University of Ohio?

A. Yes, sir.

3 Q. For how long have you made geology a study—an especial study?

A. I may say for the last twenty years I have devoted my time principally to it. For a number of years before that it was one of my studies.

4 Q. For how long have you devoted yourself or given special attention to the subject of petroleum and natural gas?

A. For about six years would cover the special attention that I have given to it.

5 Q. Have your investigations been confined to the observation of the field or have they been extended to the study of other writers and authors of repute upon these subjects?

A. They have been extended to the study of other writers—of our geological authorities, so far as they have come within my knowledge.

6 Q. Will you state who are at present the recognized authorities on these special branches, as writers?

A. Prof. Leslie, of Pennsylvania; Prof. Ashburner, of Pennsylvania; John F. Carll, of Pennsylvania; Prof. J. S. Newbury, of New York, are among the American geologists whose names would come to me first in that connection. I would add Prof. J. C. White, of West Virginia.

7 Q. Have they published works on these subjects?

A. Not formal works—aside from Mr. Carll, who has published reports in the series of the Pennsylvania survey, and Mr. Ashburner, to some extent—but they have published articles in the papers from time to time.

8 Q. These gentlemen are all professors in institutions of learning, are they?

A. No, sir; not all.

9 Q. Are they all recognized as writers upon these subjects?

A. Yes, sir.

10 Q. And they have published works?

A. They have discussed these subjects in their geological writings.

11 Q. Are you familiar with any of what I may call the practical treatises upon these subjects—that is, writings by practical men who have had experience in the use of petroleum and natural gas as a fuel?

A. I don't recall any extended statements from such sources.

13. Q. Are you acquainted with a book written by Mr. Crew?

329 A. In a general way, sir. I have not made myself thoroughly familiar with Mr. Crew's books.

14 Q. Is he recognized as one of the reliable authorities in the country on practical questions relating to petroleum and natural gas?

A. I confess, in looking into his book, I was not inspired with great confidence, and I didn't know what his standing was from any outside reputation. Mr. Crew published a work in which all the parts I was specially interested in were excerpts from authors I already knew.

15 Q. You are familiar with the reports and writings of Mr. Ashburner?

A. Yes, sir.

16 Q. And with his essay read before the mining engineers?

A. Yes, sir.

17 Q. They are regarded as authority upon the subjects of which they treat, are they?

A. He is a very capable geologist; yes, sir.

18 Q. Are you acquainted with the articles written by Mr. Carnegie, of New York, printed in the Scientific Monthly, upon the use of natural gas as a fuel?

A. I recollect to have read the articles. I think it was in Scribner.

19 Q. Was it not in the Popular Science Monthly?

A. Yes, sir. I remember of reading Mr. Cannagie's articles at the time.

20 Q. Were you familiar with the Western Pennsylvania field before the development of the Ohio field?

A. Yes, sir. I had a general knowledge of it. Yes, sir. I knew that field before the development of the Ohio field.

21 Q. Are you familiar with the life of wells in that field?

A. Yes, sir. When you ask me whether I am familiar I hardly know how to answer the question. I have kept all the run I could get of the field, but I couldn't, perhaps, answer questions which will show familiarity with the field. I am acquainted with the general history of the field.

22 Q. How long has natural gas been known?

A. From the morning of history, you may say.

23 Q. How long have flowing wells been known in the United States?

A. Well, I got my college training by the light of natural gas that was burned in Fredonia, New York, and that goes back to 1840 or something. It had been burning twenty years before that.

24 Q. How long did you know those wells there—how long had you personal knowledge of them?

A. I knew them from that time on; have known them to this day. Gas wells are flowing there still.

25 Q. They are still flowing, are they?

A. Yes, sir.

26 Q. And do you know historically that they had been flowing twenty years before that time?

A. Yes, sir.

27 Q. Natural gas, you say, was known to ancient history?

A. Yes, sir.

28 Q. How long have the wells in the neighborhood of the Caspian Sea been known?

A. They antedate history; go back as far as before the records show.

29 Q. How long have the wells of China been known?

A. They also go back to a high antiquity.

330 30 Q. Do you know anything about the use of natural gas in China for manufacturing purposes?

A. Yes, sir; it is used in salt manufacture.

31 Q. Isn't it true that they have been using it there for centuries?

A. Yes.

32 Q. In the neighborhood of the Red Sea are there also known gas wells?

A. I don't recall any locations in the neighborhood of the Red Sea; but I recall some recent explorations there, and I don't recollect any old centres there, but it is quite likely.

33 Q. Recent explorations for what?

A. The recent explorations were undertaken with reference to oil by the Egyptian Government, as I understand.

34 Q. Was the result the development of gas?

A. I have not seen that. I have no fresh information in regard to that.

35 Q. In Russia have gas wells been known for some time?

A. In the south of Russia; that would be the Caspian field.

36 Q. In any other part of Russia?

A. I have no information of any anywhere. It is a recent development if there is any anywhere else.

37 Q. How long since natural gas has been known in West Virginia?

A. From the boring of the salt wells, in 1808. It was known before that time by the burning springs. Gen. Washington owned a tract in which a natural spring occurred.

38 Q. How long has it been utilized in Virginia for manufacturing purposes?

A. Since 1808—no; it comes in later than that—well, for forty or fifty years, we will say, at least.

39 Q. Are the wells in that field still flowing?

A. Yes; there are wells in that field still flowing.

40 Q. How long has natural gas been known in Western Pennsylvania?

A. Since the same date—it was discovered in the drilling of the salt wells, which began in 1808—downwards.

41 Q. How long since it has been utilized in the Western Pennsylvania field?

A. It has been utilized there since the oil excitement of 1861 and 1862—through that time—in considerable quantity.

42 Q. Was it in use before that in the salt industry?

A. I suspect that it was, but I have no knowledge of that.

43 Q. Are the wells in those fields still flowing?

A. There are wells in that field still flowing, but not the same wells which were opened first, in all cases.

44 Q. What has been the development of the production in the Western Pennsylvania field since the time it was first used extensively for manufacturing purposes?

A. There has been an enormous development.

45 Q. Is it not true that there is a greater visible supply of natural gas at present in the Western Pennsylvania field than at any other time heretofore?

A. More gas being used and brought to the surface?

46 Q. Yes, sir.

A. I doubt that, but I am not positive in regard to it. There was a time when a great deal of gas went to waste. Now it is being eagerly sought for and used.

331 47 Q. Is it not true that there are more lines and of greater capacity leading from the gas fields of Western Pennsylvania now than at any other previous time?

A. Yes; more lines and of larger capacity; yes, sir.

48 Q. Is it not true that there are more lines in process of con-

struction to the fields—were there not during the past year more lines in process of construction to the fields than at any other previous time?

A. Yes, sir.

49 Q. How long has natural gas been known in the State of Ohio?

A. From this same early date—from before 1820—along 1814, '15, or 16, drilling was going on in the Muskingum Valley, and Southern Ohio developed natural gas.

50 Q. Are there wells still flowing in that region?

A. Yes, sir; there are some wells there which were drilled in that early time from which some gas escapes still; yes, sir.

51 Q. How long has natural gas been known in Northwestern Ohio?

A. Well, sir, it has been known from the settlement of the country—in these escapes of gas. Since 1838 was the first record I got in Findlay.

52 Q. How long since it has been developed and applied to domestic and manufacturing uses?

A. That was begun—domestic uses was begun quite early by Dr. Carr, who availed himself of the gas that escaped from the wells dug in his own yard, and I think it was in 1844 or 1845—it goes a good ways back—when the gas was introduced into the grate in his house. If you make account of so small a fact as that it would carry it back a good ways; but the other developments began—in 1885 was, I think, the first.

53 Q. You speak now of the Findlay field?

A. Yes, sir.

54 Q. Were there wells drilled earlier in the vicinity of Mount Vernon?

A. Yes, sir.

55 Q. How long ago was that?

A. That was in 1860—1860 to 1865.

56 Q. Were there also productive wells drilled in Northeastern Ohio?

A. Yes; at an early date.

57 Q. How long ago?

A. They go back to '65 or thereabouts.

58 Q. Are they still flowing?

A. Some of them are; yes, sir.

59 Q. Have they been in continuous use ever since?

A. Some of them; yes, sir.

60 Q. What is the character of the field about Fredonia—light or strong?

A. As to the production of the wells, very light, sir. The shale gas is what they have there.

62 Q. What is the character of the field in Virginia, as to productiveness?

A. It was fair to middling. Those are good wells that are gotten there, frequently. The early wells were small springs of which we spoke—small outflows.

63 Q. What is the character of the Western Pennsylvania field?

A. Large wells and high pressure.

64 Q. And in Northwestern Ohio?

A. Large wells and high pressure.

65 Q. Are there other gas fields in Ohio besides those which you have mentioned?

A. Yes, sir; the Cambridge field, the Macksburg field, the
332 Marietta field, the Steubenville field. I might name those and think of the best, perhaps—the Wellsburg field. There is gas in Clairmont county, in small measure—you can scarcely call it a gas field—in the vicinity of Felicity and Williamsburg, in Clairmont county. Gas has been utilized there. I don't know that I can recall other fields outside of the general district. A small production has been found in Southwestern Ohio.

66 Q. What about the Lancaster field?

A. Yes; I beg pardon. The Lancaster field—Hadley Junction and Newark—is a field of considerable importance.

67 Q. How about the Mercer and Auglaize?

A. I supposed you meant to include them. I understood you to cover them in the Northwestern Ohio, the Mercer, and Auglaize field. That is an important field. The Lancaster, Fairfield, and Licking county fields are quite important fields.

68 Q. Will you enumerate what may be called the strong fields of Ohio?

A. The Findley field, including the Wood county connections, would rank first. The Mercer-Auglaize field would rank next. The Lancaster field has higher pressure and has large volume of the wells, but it would be counted, I think, inferior to these. The Lancaster field might be made to include the Hadley and Newark fields, as there is almost connection established between those districts.

69 Q. These are what are known as high-pressure gas fields, are they?

A. Yes.

70 Q. In what horizon is gas found in these fields?

A. In two horizons. In the Trenton limestone, in the Northern fields, and in the Clinton, in the Lancaster, Hadley Junction, and Newark field. There is high-pressure gas found in Cambridge and in Macksburg, and in Marietta also.

71 Q. In what horizon?

A. In the Berea grit.

72 Q. At what depth is gas found in the Findley field?

A. At the depth of eleven hundred to eleven hundred and fifty feet, as a rule, depending on the elevation of the surface.

73 Q. At what depth is it found in the Mercer-Auglaize field?

A. At from nine hundred to eleven hundred feet—say one thousand feet.

74 Q. Found in the Clinton rock?

A. Yes, sir.

75 Q. At what depth in the Lancaster field?

A. About two thousand feet. In that field it is found in the Clinton.

76 Q. At what depth is gas found in the other high-pressure field which you have mentioned—about Cambridge?

A. About fifteen hundred feet above the valleys in the Berea grit.

77 Q. What is your theory as to the origin of natural gas?

A. I think it is derived from the decomposition of organic matter in the rocks—vegetable and animal.

78 Q. Is the organic matter indigenous to the rocks in which the gas is found?

A. The organic matter was deposited in the rock at the time the rock was formed, if that answers your question.

79 Q. Is the organic matter found only in the strata in which the gas is found?

A. No, sir.

333 80 Q. It is found in the associated strata also?

A. Yes, sir.

81 Q. Below?

A. Yes, sir.

82 Q. And gas, then, is a production of the strata in which it is found?

A. It may be produced in the same strata in which it is found, but generally we find it situated in the porous strata overlying the source.

83 Q. It is produced by the deposition of organic matter in the strata found below the porous rock in which it is situated?

A. Yes, sir.

84 Q. It escapes through the intervening strata, does it, in which it is formed through the intervening strata?

A. Yes, sir; it seems to have passed upward.

85 Q. Is the production of petroleum similar?

A. Yes; I count gas as a secondary product. I count the petroleum the first stage in the operation.

86 Q. And the gas is produced from the petroleum, how?

A. The petroleum product breaks up into—after the fashion of organic bodies—into simpler compounds.

87 Q. By evaporation?

A. No, sir; by the chemical bond being loosened. All organic bodies seem to have a tendency to pass into simpler forms, as water, carbonic acid, and carbureted hydrogen, and I would say it was in obedience to that law.

88 Q. Do you know or have you an opinion as to whether this process of decomposition is still going on?

A. I have an opinion, but I can't say that I know.

89 Q. Will you give your reason for it?

A. My opinion is that the decomposition is not going on at the present time. The reason that I find is that there is not a temperature high enough found in the rocks to secure the decomposition of the organic matter in the way of destructive distillation.

90 Q. Isn't it the opinion of others that the process is still going on?

A. Yes, sir; oh, yes, sir.

91 Q. Who, among scientific investigators, have entertained the contrary opinion?

A. Dr. Newbery is very positive that the decomposition is still going on at the present time, but he makes the rate a slow rate.

92 Q. And Prof. Ashburner?

A. I don't remember his view in regard to that.

93 Q. I will call your attention to his article read before the Society of Mining Engineers, or the American Institute of Mining Engineers, on page 11, where he says: "That the bulk of the gas which can be obtained for commercial purposes now exists and is stored up in inexhaustible reservoirs, I have no doubt; still at the same time there is a slow accretion to the supply constantly going on which is a product of the continuing distillation of carbonaceous matter contained in the rocks."

A. Yes, sir; that is his view.

94 Q. It is also Prof. Newbery's view, is it not?

A. Yes, sir; it originates with him, I think.

95 Q. What have you -- say as to the opinions of Prof. Ashburner as to the gas being stored in inexhaustible reservoirs?

A. I have to say that I do not believe it.

96 Q. That is merely a matter of opinion and theory?

334 A. It is a matter of opinion and theory; yes, sir. I don't think Professor Ashburner believes it; I think that is a mere rhetorical flourish.

97 Q. Do you mean to say that your opinion of Professor Ashburner is such that you think he would state as mere rhetorical flourish a scientific fact like that?

A. I have a very high opinion of Professor Ashburner, but I have such a high opinion of him that I can't think he would use that word "inexhaustible" in the ordinary sense of the word——

98 Q. That is, in the sense that he would consider the supply eternal?

A. No, sir.

99 Q. But may it not be properly and consistently taken in the sense that it is practically unlimited, like the coal fields, for instance?

A. The coal fields are by no means "practically unlimited;" but, if you make that your standard, I would still say that limits would be narrower.

100 Q. I am not speaking of your views. You have ventured the statement that Prof. Ashburner didn't think that.

A. That I should like to recall. I wouldn't like to appear to criticise my friend Prof. Ashburner's statement, but I cannot understand what he should mean by "inexhaustible supplies."

101 Q. Is it not true that the view is entertained by very respectable authority that the supply of gas is perhaps no more exhaustible than the supply of coal?

A. I know no geologist who holds such views.

102 Q. Perhaps not in that language nor by that comparison, but that the supply of gas is enormous.

A. Yes, sir; I believe it myself, that the supply of gas is enormous.

103 Q. That it is sufficient to supply the wants of the communities where it is found for a great many years to come?

A. Well, sir, I don't know the authorities that I would have respect for that have spoken on those questions aside from Prof. Ashburner, and I think he committed himself perhaps more strongly than any other geologist. Prof. Leslie, for example, takes decided ground on the other side.

104 Q. Prof. Newberry, does he not speak upon that subject in a similar strain with Prof. Ashburner, but perhaps not with so much certainty?

A. I don't recall any recent utterances of his.

105 Q. Does he not entertain that side—a view upon that side of the case, so to speak?

A. He does believe in the constant formation of gas, but he always connects it with the smaller supply of shale gas, and he thinks that supply is kept up, but that is a low-pressure gas, and I do not think he has had any experience with high-pressure gas.

106 Q. Prof. Ashburner is connected with the geological survey of Pennsylvenia, is he not?

A. He has been; yes, sir.

107 Q. And for a number of years?

A. For a number of years; yes, sir.

108 Q. And there is the greatest production of gas in that State of any State in the United States, is there not?

A. Decidedly; yes, sir.

109 Q. There are more extensive opportunities for ascer-
335 taining the facts surrounding the high-pressure gas of Pennsylvania than in any other part of the country, are there not?

A. Yes, sir; that is true.

110 Q. Do you remember the view which Mr. Carnagie took upon this question of the permanency of the supply?

A. No, sir; I don't recollect that distinctly. I remember to have read the paper at the time.

111 Q. I will call your attention to the article of Mr. Carnagie on natural-gas fuel and its application to manufacturing purposes, an article read before the Iron and Steel Institute of London and published subsequently in the Scientific American, and ask you if you remember to have read the article at the time it was published.

A. I suppose I read it at the time it was published; yes, sir.

112 Q. I will call your attention to the expression of his views on this subject as follows: "Bearing in mind that it is never wise to prophesy unless you know, I hesitate to speak of the future; but, considering the experience we have had in regard to the productiveness of the oil territory, which is now yielding seventy thousand barrels of petroleum per day, and which has continued to increase year after year for twenty years, I see no reason to doubt the opinion of experts that the territory which has already been proved to yield gas

will suffice for at least the present generation in and about Pittsburgh." What would you say as to that opinion?

A. Oh, I don't share it, sir. I doubt whether Mr. Carnagie would express it now.

113 Q. It is true, is it not, that the production of gas, like the production of oil, in that field has increased from year to year since its discovery?

A. There are a larger number of wells and a larger number of districts.

114 Q. Has not the production of gas increased from year to year in that field since it was discovered?

A. Through the development of new territory; yes; up to the present. I don't know just what the figures are. There was a very large production went to waste in 1884 and 1885, and that we have no means of knowing how great it was. At the time the field was first opened it took the cream of the field—this waste in all Western Pennsylvania—so I should not want to commit myself to the opinion that there is a larger production now.

115 Q. I will call your attention to a work by Mr. Crew, and particularly to that portion of it relating to the permanency of the supply of natural gas, where, after referring to a number of particular wells, and then to the fields—the Butler county field of Pennsylvania, the Venangon county field, the West Virginia field, and the Fredonia field—he then goes on to say, speaking of the supply: "This has continued for twenty-three years, and there does not appear to be any diminution in the supply of either brine or gas. We have no right, perhaps, to expect a continuance of the 'roarers' or the 'gushers,' as they are termed, but from the facility with which the gas is reached in a large stretch of territory we may reasonably expect a continuance of the supply. It may be necessary, perhaps, to arrange for the storage in capacious gasometers of the supply coming from a number of smaller wells and for its distribution
336 from these. It is the opinion of those who have devoted considerable attention to this that with proper care in its collection and distribution the supply of gas to Pittsburgh for manufacturing purposes is an assured thing. The large investment of capital is the best evidence of the faith that is placed in it. The number of companies chartered to supply natural gas in Pennsylvania up to February 5, 1885, was 150, representing a capital stock of $2,160,580. Since that date a large number of new charters have been granted." What would you say as to that opinion, first, that from the developments they may reasonably expect a continuation of the supply, and, second, that the supply is practically a sure thing?

A. I should dissent from both of those opinions.

116 Q. Your theory of the origin of gas was that it was caused by the decomposition of——

A. Of the original organic matter.

117 Q. Are you familiar with the theory of Berthelow?

A. Yes, sir.

118 Q. What is that theory?

A. The theory that natural gas and petroleum are the products

of the decomposition of meteoric water, atmospheric water, falling through the strata of the earth and coming in contact with metallic iron at high temperature or with masses of metallic sodium and potassium at high temperature.

119 Q. Then that it was of chemical origin?

A. Yes, sir.

120 Q. Do you know what experiments he resorted to to prove the theory?

A. Yes.

121 Q. What were they?

A. They were the decomposition in the laboratory of red-hot iron by metoric water.

122 Q. What was the result?

A. He obtained these substances; yes, sir.

123 Q. Is that considered a reasonably fair demonstration of his theory?

A. No, sir; the possibility of this combination can be granted without our believing that the conditions which are required are possible. The chemical possibility, of course, is established, but the geological probability is another thing altogether.

124 Q. But if his theory of the production of natural gas is correct, then there would be no question of its continuance up to the present time?

A. No, sir; but we then couldn't be sure that the supply would be formed as fast as we take it out.

125 Q. You have said that the supply of natural gas is not inexhaustible?

A. Yes, sir.

126 Q. By that you mean that it is not eternal?

A. Yes, sir.

127 Q. Do you know of anything that is?

A. No, sir; not in the way of power; no, sir.

128 Q. Or matter, that is eternal?

A. Well, I wouldn't go into the philosophical question of the eternal duration of matter.

129 Q. Which are the more persistent, the light or the strong fields?

A. The light fields. I distinguish between the gas that is held under salt-water pressure and the gas that exudes from the shale.

130 Q. And of these which is the more persistent?

A. The gas exuding from the shale makes light wells, and those are the persistent wells that go on from one age to another.

337 131 Q. Do we have both in the Findlay field, both the shale and the high-pressure gas?

A. No, sir; we have no gas in the Findlay field that does not come under the salt-water pressure. We have gas in the shale formation, it is true, but we have no gas in the Findlay field of the low-pressure type except in the springs from which gas finds its escape.

132 Q. Is it not true that in every well or nearly every well drilled in the Findlay field gas is found in the shale before striking the Trenton?

A. Yes, sir; it is not the shale we speak of when we speak of shale gas in Northern Ohio, for example.

133 Q. But there is gas shale in the Findlay field?

A. Yes; but the salt water comes with it, so it is high-pressure gas.

134 Q. Does salt water come with that gas?

A. Yes, sir.

135 Q. In what cases have you known that?

A. Well, I have known it in quite a large number of instances in which salt water has been found; not at the time when the gas is struck, but it has followed up in those veins so they have had to shut it out of those wells.

136 Q. To what wells do you refer?

A. I don't know that I can recall the wells distinctly, but, let me see, I can't name any wells, but I will tell you the ground upon which I go, that the pressure of that gas is adapted to the depth at which it is struck, which proves the salt-water column, and I know that salt water has been struck in levels through that field, but I don't recall the wells.

137 Q. Is it not true that in drilling for oil in Northwestern Ohio they uniformly strike gas in the shale?

A. There are several phases that are quite constant in the shale; yes, sir.

138 Q. Is it not true that when they strike those for the purpose of getting a well free from water the casings only extend to the top of the shale?

A. Generally they put casings on the top of the shale and no further—that is, about eight hundred feet below.

139 Q. If they get oil below it why is it necessary to extend it to the shale?

A. It would be. An example comes to me now. In one of the wells drilled by the Cincinnati syndicate they found oil in the shale, and they assured me that salt water came with it. It was a well which, I think, your people were interested in.

140 Q. It was not taken as a gas well?

A. No, sir.

141 Q. Didn't that salt water come from too deep drilling and they drill through the Trenton?

A. No. I visited it, and they assured me that it came from the shale.

142 Q. Isn't it true that salt water has never been found in the shale in the Northwestern Ohio field?

A. I think that salt water has been found in the shale; I think so. I am not certain that I can recall any examples.

143 Q. Why do they stop casing at the top of the shale?

A. That generally gives you a dry ground. If you get gas and have a salt-water well you could case. You wouldn't have a heavy flow of salt water at any time, because the shale is open.

338 144 Q. Does not the driller understand that the shale is free from water?

A. Yes; that is what he supposes.

145 Q. And when salt water is discovered in a well does he not put a plug in the Trenton?

A. Yes, sir.

146 Q. If the salt water came from the shale what would be the object of putting the packer in the Trenton there?

A. It is the usual order. I believe that what gas escapes is under salt-water pressure when it comes in under three or four hundred pounds pressure. I recall examples in which these facts have been given to me as to salt water coming in at that pressure. There is no question about the shale being expected to be dry.

147 Q. You have no personal knowledge of any such instances as you referred to in the Cincinnati syndicate well?

A. I could not have personal knowledge except by the facts given me.

148 Q. Which of the Leazer wells was that?

A. It was in the edge of the woods.

149 Q. Could you locate it?

A. I think I could. (Witness refers to a map.) No; I don't recollect which it is.

150 Q. How long ago was that?

A. In July or August I think I was there.

151 Q. It was the first well drilled on that tract by Leazer, was it not?

A. No, sir; I think not. I think there were two or three. They didn't open the well for me. There were other wells being drilled all around there. It was a well that has salt water in.

152 Q. They only found salt water in one of those wells?

A. In only one; no, sir.

153 Q. That was the first one?

A. Well, you have the facts and I have not.

154 Q. Is the gas fed into the Trenton vertically or horizontally?

A. I would suppose it had been gathered from below, but I presume that that now must be accounted, after being stored, by being fed to the wells in a horizontal way.

155 Q. How do you account for the fact that no two wells have ever been connected, no matter how closely drilled?

A. I wouldn't want to accept that as a fact.

156 Q. What do you know about the fact?

A. I know that very free communication exists; that one well affects the flow of another, and that shots go from one well to another.

157 Q. Do you speak from personal knowledge or simply from what other people have told you?

A. How could I speak from personal knowledge except from what people tell me? I go to the ground and get the facts there as far as I can from the drillers.

158 Q. All you know is what some one else has told you?

A. Yes, sir; I have not drilled a well.

159 Q. You have not tried an experiment with a completed well to see how it affects another well yourself?

A. No, sir; I have no way of doing that.

160 Q. You have no special knowledge on that subject not accessible to everybody else?

A. No, sir; no knowledge not accessible to all others.

339 161 Q. How do you account for the fact, if it be a fact, that what is known as a dry hole is found in this gas territory, and then very close to it you may drill and get a producing well?

A. The Trenton generally explains that fact in itself. It has a finer, closer grain.

162 Q. When a well becomes exhausted and another well is sunk in close proximity to it, and that one yields, how do you account for that?

A. A similar state of facts would explain that. The whole mass of the Trenton is not freely communicable. There are places where it don't communicate.

163 Q. Do you know the extent, character, or direction of these partitions?

A. No, sir; that is only to be told by the driller.

164 Q. You have no personal knowledge as to the extent to which any particular well will drain a territory, have you?

A. I have a good many facts that bear upon that, certainly, but I don't know what you mean by "personal knowledge." I have not drilled wells.

165 Q. From your own experiments, not what people have told you?

A. Well, I have to depend upon what people tell in regard to these things. I have not drilled wells, nor have not had first-hand information.

166 Q. Don't you know, from your connection with these people, that a great majority of the people who drill and own wells, in the first place, know very little about these facts which you value from a scientific standpoint; and, secondly, that they constantly and intentionally misrepresent facts?

A. Yes, sir; I understand all those elements.

167 Q. The information which you receive on that subject is no more reliable than that which would be received by anybody else?

A. No, sir; although I come in contact with all of the interests in the field.

168 Q. None of the drillers are required to make reports, are they?

A. No, sir; but I will say that I have been allowed to take repeated measurements of certain wells in certain parts of the field. For example, the owner of a large company allowed me to go over its ground and make measurements; that was in the Auglaize-Mercer field, and I have made measurements in the earlier times, and those measurements are my own. Of course, I have to depend as to the depth of the wells and their condition, etc., upon the records furnished me.

169 Q. Coming to the subject again of the territory drained by a particular well, have you ever conducted any experiments yourself for the purpose of testing that?

A. I think I may say so; yes, sir.

170 Q. Where?

A. In the Mercer county field.

171 Q. What wells?

A. In the Axe well.

172 Q. What experiments did you conduct there?

A. I measured the well when it first came in, and knew the rock pressure at the time, and then I repeated the measurement of that well two years afterwards, and determined the rock pressure at that time, and the well had not been opened except for the use of a single residence out on the farm. It had not been piped; it had not
340 been reached by any of the pipe lines, but I found that the gas had fallen off and the pressure was reduced, and I found that the nearest well to it was a well that had been drawn hard, and was a half a mile distant.

173 Q. Did you open the first well—gas well—and then shut off the well a half a mile distant?

A. No, sir; the well was not drilled at that time.

174 Q. I mean when you measured the second time?

A. When I measured the second time the well was shut up.

175 Q. Did you open it to see if it produced any effect upon the first well?

A. No, sir.

176 Q. Then your experiment consisted only of the measurement of the well at a given time and then the measurement of the well two years later?

A. Yes, sir.

177 Q. During which time you were informed that it had not been opened and during which time another well had been drilled a half a mile distant.

A. Yes, sir.

178 Q. What is the cause of a well stopping up where it neither becomes wet nor produces oil, but simply dries up—what is the cause of it?

A. I think it would be the escape of the accumulated gas.

179 Q. Isn't there such a thing known as the paraffining of the rock?

A. Yes; that is very common.

180 Q. Does that happen more readily when a well is closed than when the well is flowing?

A. Not that I am aware of.

181 Q. Don't you know it to be a fact that one of the necessary things to do for the care of a well is to blow it off at least once a week to remove the accumulated deposits?

A. Yes, sir.

182 Q. To keep free communication through the rock?

A. Yes, sir.

183 Q. Don't you know that the closing of a well for two years is almost certain to result in the paraffining of the rock?

A. No, sir. I don't think the gas tends to paraffine the rock; it was salt water behind this—salt water coming into this well.

184 Q. What was the condition of the Trenton rock at the second time it was measured?

A. There was salt water delivered with the gas.

185 Q. Any other peculiarity?

A. The pressure had fallen off and the volume had fallen off, but no other peculiarity that I was able to get at.

186 Q. Do you mean to be understood as stating the fact that the failure of that well was the drilling of the other well a half a mile distant?

A. That is my opinion of it. I have more facts bearing on that same point. I don't know that I have any other that would be as significant.

187 Q. Did you take a measurement of the well to find out what depth it was in the Trenton?

A. No, sir; I don't think I saw that well measured; it was 1,138 feet as it was given to me.

188 Q. Did you measure to find out whether the well had been filled up or become obstructed in any way?

A. No, sir; I had no facilities for doing that.

189 Q. Do you know whether the result was due to the ex-
341 haustion of the well or of an obstruction to the well?

A. No, sir. The gas seemed to flow freely, but salt water followed it very soon. After it had been open a few minutes the column of salt water was delivered.

190 Q. How long did you allow the well to flow?

A. I think it flowed about a half an hour, all told.

191 Q. Did it continue to blow salt water?

A. Yes, sir; as long as we allowed it.

182 Q. Is it not true that if the casing is defective the water will come in from above?

A. They struck no salt water above, as I remember. In all that field the salt water comes with the gas or very soon. There is a shaly portion of the rock free and given to dry gas.

183 Q. If that is true, that salt water appears in the gas rock, should not salt water have appeared in the well being used instead of the one not being used?

A. It did follow, and they have to-day a heavy back pressure on all those wells to keep the salt water away.

184 Q. Wouldn't it have appeared in the well flowing first rather than in the well that was idle?

A. That would depend upon the relief following. If the other well was struck upon a higher portion of the rock salt water would strike the other first. The only means I have of knowing that this last was invaded was by seeing salt water in it and the other had been overrun.

185 Q. Then it might have flowed from the other well into this, might it not?

A. Yes; I couldn't tell which way the water would move.

186 Q. Isn't it one of the laws of the State that wells flowing salt water shall be plugged for the very purpose of keeping salt water from invading other wells?

A. Yes, sir.

187 Q. Was that not done?

A. No, sir; they couldn't do that in that gas field, because all the wells flow salt water; if they draw the well off to exhaustion it will flow salt water. A large number of them are already flowing salt water.

188 Q. You have said that the Karg well, one of the most famous, perhaps, in the Findlay field, has become exhausted?

A. So it was reported to me.

189 Q. You have no personal knowledge of it?

A. No, sir; I tried to investigate it, but I have not had an opportunity to investigate it.

190 Q. To what extent has the drill invaded the Karg well?

A. Quite numerous wells, within a thousand feet, I think.

191 Q. What kind of wells do they get?

A. They have got some small wells and some larger ones.

192. Q. Is it not true that they have found unproductive wells in the immediate vicinity of the Karg well, which were allowed to become overflowed with salt water?

A. I don't know that. The city of Findlay drilled the nearest to the Karg as I know. They took such care as they took of other wells. They let it run wide open, and that invites in the salt water.

193 Q. Isn't it true that wells were drilled in the imme-
342 diate vicinity of the *immediate vicinity of the* Karg well and allowed to be overcome with salt water, and wouldn't that have an effect upon the Karg well?

A. Well, they are all bound up in one bundle. The Karg well, I presume, depleted the field more than all the rest, because that was the largest well.

194 Q. Your theory, I believe, is that the gas lies in the rock as in a reservoir?

A. Yes, sir.

195 Q. First gas and then oil, if there be oil, and then salt water?

A. Yes, if there be oil, and then the salt water upon the gas.

196 Q. Would you say that this lies in the shape of an inverted reservoir?

A. Yes, sir.

197 Q. Then, if you took it out of the summit or top, in the course of time you would exhaust the entire amount of gas, wouldn't you?

A. Yes, sir.

198 Q. And as you kept going down the inverted reservoir you would finally strike water?

A. Yes, sir.

199 Q. The bottom of this body of gas is horizontal, is it?

A. No, sir.

200 Q. How does it lie?

A. In Findlay there was an arch of a hundred feet to begin with. In Findlay there are two terraces, practically separated by Main street. On the east side the terrace in the Trenton lies three hundred feet, approximately, below tide water. The western terrace—say a half a mile to

the west of Main street—is, approximately, four hundred and fifty feet below tide water. From the three hundred feet down to the four hundred and fifty feet there is a steep descent. When wells first began to be drilled in Findlay they struck the upper terrace, but they presently went down and down until they struck dry gas four hundred feet below tide water. We knew then that we had a field of dry gas from four hundred feet below tide level up to the level of the higher terrace, and that has been overrun from stage to stage, and that is where I have got a large part of my information in regard to the behavior of the field. It has been overrun by salt water and the oil in connection.

201 Q. Then it lies not in the form of an inverted reservoir?

A. Yes; that would still be an inverted reservoir, and the gas had accumulated so as to crowd the oil and the salt water down below the level of the upper terrace—followed the porous rock down as the porous rock itself went down.

202 Q. What I want to get at is this: whether the gas, water, and oil—if there be oil—lie, as you might say, under a bowl.

A. Yes, for any one well, but when you have a structure like that which Findlay shows you will have a porous belt holding gas at a lower level, for example.

203 Q. Then what?

A. That is where we found the first gas. That porous rock falls down, and there is so much gas it has followed along and occupied that.

204 Q. If we could imagine an inverted bowl filled with gas, oil, and salt water, the gas would all be in the top, wouldn't it?

A. Yes; I understand that.

205 Q. And the bottom would be horizontal?

A. That would depend; it was not horizontal.

343 206 Q. But if we had it in a bowl the bottom of the body of gas would be horizontal?

A. Yes, sir.

207 Q. And then as you proceeded to pierce that bowl from the summit down along the sides you would finally come down to where you wouldn't get gas at all?

A. No, sir.

208 Q. And going still further down you would strike water?

A. Yes, sir.

209 Q. Does the gas lie in the Trenton in that way?

A. Substantially, if you will take the qualification I made in regard to the warping of the rock. There is a certain portion of the limestone porous rock included in the upper portion of the Trenton, and when the Trenton dips this porous portion dips with it, and your tools may go lower down in one place than in another.

210 Q. Then you may drill into the Trenton at a point lower than the bottom of the Trenton at the summit and still get gas?

A. Yes, sir.

211 Q. You may drill into the synclinal and still get gas?

A. Oh, yes, sir; you may have gas in the synclinal; some.

112 Q. Good gas?

A. I don't know of any wells that have any durability. Mr. Ashburner has reported some, but I think he has been beaten upon that point pretty fully already.

213 Q. I want to refer you to Mr. Ashburner's report upon that subject. Does he not say——

A. He says gas may exist in the synclinals; yes, sir.

214 Q. Does he not say that it not only may exist, but some of the best wells——

A. Yes; but all of the progress since that time has set aside Mr. Ashburner's views.

215 Q. Do you dispute the fact that good wells did exist in the synclinal?

A. I doubt whether a careful observation has been made. He lost on that. He had a sharp argument with Prof. White, and Mr. White established his point. I remember the statement and I recognize that Mr. Ashburner testified to that effect.

216 Q. I will call your attention to this statement of Mr. Ashburner in his paper read before the Institute of Mining Engineers, on page 10: "If the reservoir rock were uniformly porous and homogeneous over the arch of the anticlinal, the crown of the latter being level and its cross-sections transverse to its axis being entirely similar throughout its extent, the best gas-producing territory would, of course, always be found on the crest of the anticlinal immediately over the anticlinal axis, and the so-called anticlinal theory would always be a safe and unvarying guide for the location of a gas pool. Such conditions are never universal in any oil or gas district with which I am familiar. There exist in all gas pools many modifying and purely local conditions which must enter into the consideration of the best localities in which to drill a well either for oil or gas." What would you say as to that statement?

A. I should say that that was entirely sound, sir.

217 Q. I also refer you to an article of Prof. Ashburner, published as an appendix to the work of Mr. Crew and entitled "The Geology of Natural Gas," on page 472, in which he says: "Although the dip of the gas sand and position of the anticlines and syn-
344 clines have an important bearing upon the occurrence of gas (in many cases this would seem to be the most important consideration), yet it is not believed that natural-gas wells can be located on what has been formulated as the 'anticlinal theory,' since all great gas wells are not found along anticlinal axes, although some of the largest and most important wells in Pennsylvania have been drilled in synclines which have found gas. These two statements are of great importance, since a large amount of money is now being expended in drilling wells which have been located on the basis of the so-called anticlinal theory." What have you to say as to that statement?

A. I think the professor would modify it. All recent experience has been in favor of the anticlines entirely. He lost on that point.

218 Q. Is the statement of fact true that gas wells have been found in the synclinals?

A. I suppose so. They are claimed to be short-lived. I have no

personal knowledge of gas in the syncline; it would be a subordinate axis in the syncline that would give any chance at all in the syncline.

219 Q. Are the anticlinal lines in the Trenton and other gas-bearing rocks traced as continuous or connected from the Southeastern and Southern Ohio fields to the Northwestern Ohio field?

A. Not at all, sir; I don't think we have any right to speak of anticlinals in the Trenton, so far as our knowledge goes. We have terraces in the Trenton and not anticlinals.

220 Q. Are they to be traced into the Indiana field from Ohio?

A. The terraces are; yes, sir.

221 Q. Are they uniformly productive?

A. No, sir.

222 Q. Are the anticlinals always productive?

A. No, sir; anticlinals are not always productive. I said I would not recognize anticlinals in the Trenton limestone.

223 Q. Are there not anticlinal lines in the Trenton?

A. There are structural lines that could be, perhaps, by a stretch of the term called anticlinals, but it is not a strict anticlinal structure that we find in the Trenton. We have a terrace structure in the Trenton which gives the same general result; but an anticline is a ridge, and we don't have ridges in the Trenton. We have large areas lifted up to about a uniform level; they are similar, but I would distinguish them as terraces and not anticlinal lines.

224 Q. Are the terraces and spurs, anticlinal lines of the Trenton, known further than they are developed by the drill?

A. Yes; to a certain extent the surface rock is an indication of the level of the Trenton.

225 Q. Is that uniformly so?

A. Yes; of the level of the Trenton. Where the Niagara makes the surface the Trenton lies higher than where the water line on the same level makes the surface.

226 Q. You know nothing about the thickness of the upper strata of the Niagara?

A. No, sir.

227 Q. And, consequently, the depth of the Trenton wouldn't be known?

A. Approximately. The Niagara is not over two hundred or three hundred feet in thickness; the water lime is five or six hun-
345 dred feet. The driller does not distinguish between the Niagara and the water lime; he calls it all "Niagara." I speak of when the Niagara comes to the surface. It stands up higher than the Trenton, always.

228 Q. Cannot there be a difference of several hundred feet?

A. There could be a difference of a couple of hundred feet, possibly, but that could be read off with reference to the surrounding country with perfect confidence. The trouble, I think, comes from the confusing of the limestone and Niagara. The geologist distinguishes the Niagara from the water lime. The water lime is an oil rock. All the oil comes from under the water lime and the gas comes from under the Niagara.

229 Q. When they come to the surface they give indications?
A. Yes, sir.
230 Q. Does the water lime give that indication also?
A. Yes, sir; as to the low Trenton.
231 Q. Have you had occasion to demonstrate that by the drill?
A. Yes, sir.
232 Q. Where?
A. I indicated to the people of Kenton where they would find the Trenton at a higher level than in the wells they were drilling around, and they have, I think, drilled a dozen wells and got no result, except to prove that the Trenton lay at the right level for gas.
233 Q. What was the outcome in Lucas county, near Sylvania or Monclova?
A. There was a pitch to the northward that I hadn't figured upon.
234 Q. Didn't you undertake to indicate in advance the depth at which the Trenton could be found there?
A. No, sir; not positively; but I found a break in the rock which had made me certain that the Trenton would be higher upon the one side than the other, but the whole of it was deeper than I had made account for; it was four or five hundred feet deeper. We didn't have the Niagara there at all. We had water lime. I knew the Trenton would be deeper here, but I didn't suppose the water lime would be so thick.
235 Q. At what depth did you find the Trenton in Lucas county, near Sylvania?
A. In Sylvania I think it was sixteen or seventeen hundred feet.
236 Q. Wasn't it near two thousand?
A. No, sir; 1,600 or 1,700 feet, I think.
237 Q. It was perhaps five hundred feet lower than you expected?
A. Yes, four or five hundred feet lower; I would say four hundred perhaps—as much as I could have given.
238 Q. And after the development of the Findlay field did you indicate the direction of the line of the anticlinal?
A. The line of the break; yes, sir.
239 Q. Why do you speak of that as a break?
A. We have had that structure that I have already referred to in Findlay following through. We have a decided dip of the Trenton to the westward, and that line followed a little to the west of north.
240 Q. Then do you mean to say that that is what might be termed a one-sided field?
A. Yes; if you please. There is another descent away off to the eastward, and if you prefer to call that——
241 Q. Is that a common occurrence to find a one-sided field?
A. Yes; the structure of that has not been made enough of in geology. I think it has come to appear quite important.
346 242 Q. Is that similar to the Niagara break?
A. Yes; it is a break of the Niagara.

(Mr. THURSTIN:)

243 Q. Mr. Brown means Niagara Falls.

(Mr. BROWN:) It is a one-sided hill.

A. Not like Niagara Falls. That is a break and this is a bend. If you prefer to call it an anticlinal, I have no objection. We have set off the term "terrace" to cover the ground a little more accurately.

244 Q. You indicated the line of this break or terrace in the anticlinal.

A. Yes, sir; in my first published report.

245 Q. In what direction was it?

A. A little northwest.

246 Q. How did the developments conform to that indication?

A. They conformed very exactly. The gas and oil are separated away up in Henry township on that line. I did expect, west of Bowling Green, developments which have not yet materialized, but they have struck that same line at Perrysburg and Haskins and got some small production.

247 Q. Will you have the kindness to attach to your deposition here the maps which you have prepared and which accompany your report of the geological survey for the years 1886 and 1888, upon which are indicated the boundaries of the oil and gas field of Northwestern Ohio?

A. Yes, sir; I will do so.

(Said maps are hereto attached, marked Exhibits Nos. 1 and 2 respectively, and made a part of the deposition.)

248 Q. I will ask you whether, in connecting the line of the break or greatest production, you did not originally limit it north or northwest of Findlay to within a mile or two miles of Bowling Green.

A. Yes, sir.

249 Q. What has been the development since that time?

A. It about corresponded to that.

250 Q. Does not the development of the drill show that the anticlinal or break commences at about the southeast corner of sec. 36, being the southeast corner of Liberty township, and extending from that point northwesterly about four miles?

A. No; that wouldn't be my view. There is a trough of water lime that comes in here and cuts off production, although the salt-water trough then takes up on the other side.

251 Q. Commencing, say, in sec. 36 of Liberty township, Wood county, has not the drill shown that the terrace or anticlinal, whichever it is called, of the Trenton lies higher in the line from there to the northwest for four miles than upon either side of it?

A. Not to my knowledge. I have taken the records of scores of wells there, and such a state of things does not occur, to my belief.

252 Q. Do you know whether or not there was a very large gas well found out there in the midst of that oil field?

A. Recently?

253 Q. Last summer.

A. Well, I knew there was a spur putting out, but I thought that

was further south, south of North Baltimore, where the Derodes well came in with gas.

254 Q. You don't know about the spur that I speak of, if
347 there is one, passing off diagonally to the northwest across Liberty township?

A. No; I know of no spur there. I knew of territory of which there was some promise, but I had supposed it was larger in area.

255 Q. How many maps have you prepared showing the gas and oil fields of Northwestern Ohio?

A. I prepared a preliminary report in 1886, I think, in which I gave the facts as they appeared in 1885. That was when the first work of exploration was going forward, and then this map was my next map, and this map was prepared, say, two years afterwards.

256 Q. Then you have prepared and published but two maps?

A. But two which were distinct. These are not distinct. There is no great difference except that this has more definition inside than the other. The other was a mere rude illustration of a few facts in which I pointed out the lines as they then appeared. I will send you both maps so that you may attach them to my deposition.

257 Q. Will you indicate upon those maps which you furnish for the purpose of being attached, by red lines, the limits of the gas field?

A. As was then understood?

258 Q. Yes.

A. Yes, sir; I will do so. Shall I distinguish between gas and oil?

259 Q. If you please; yes, sir.

A. Yes, sir.

260 Q. It is true, is it not, that the geologist has followed the driller in the development of this territory?

A. Yes, sir.

261 Q. Rather than the driller the geologist?

A. Oh, yes, sir.

262 Q. Have you ever observed whether a gas well has paraffined as an oil well does?

A. I have no personal knowledge of that. In the Pennsylvania field I have heard the complaint frequently; but most of the complaints I have heard here there seemed to be an easy explanation for their failure otherwise.

263 Q. Have you ever witnessed the cleaning out of a gas well which had paraffined in this territory of Northwestern Ohio?

A. No, sir.

264 Q. Have you ever witnessed it as to an oil well?

A. I have never witnessed the cleaning out, but I have seen the products which have escaped.

265 Q. Do you understand that a gas well paraffines in the same way?

A. If it has any oil I suppose it would, but I doubt whether dry gas would make a deposit of that kind; but still I have no great knowledge upon that point.

266 Q. Is there a deposit in the burning of natural gas?

A. Yes; there is a deposit of sulphur, and if there is any oil in it you will get some other products.

267 Q. If that substance is present in the gas may there not be a deposit in the gas-bearing rock which would obstruct the wells?

A. Yes; I wouldn't deny the possibility of that; no, sir.

268 Q. Don't you know that that in some instances accounts for the failure of particular wells?

A. I don't know it as a fact, but I think that might be granted reasonably enough.

269 Q. Is not that a recognized theory which accounts for the fact of a certain well going dry and then a productive well being drilled in immediate proximity?

A. I have heard that explanation frequently, but when it
348 is given I generally find, where I have knowledge of the facts, a better explanation.

270 Q. What is that?

A. It would be the failure of the gas.

271 Q. How do you account for a gas well being drilled very close to the one that has failed and is productive?

A. We can't see into the ground to see what the connection is.

272 Q. Then there is no telling the distance from which one particular well would draw?

A. No, sir.

273 Q. Is it not true that the development of the Pennsylvania oil field in portions of it that were considered exhausted have shown that the field is still productive?

A. Well, to a small extent little wells are drilled in the old field carrying little pockets of oil, but no return to old conditions.

274 Q. And that in a field which had been abandoned as exhausted?

A. Yes; but that is very easily explained by the movements of the water.

275 Q. And others interested in the production of oil have gone over those fields and leased them again?

A. Yes, sir.

276 Q. And they have again become productive oil fields?

A. No; they have become productive in the sense of small wells being found, but abandoned again before the newspapers got the record.

277 Q. But sufficiently productive to warrant development?

A. I wouldn't think so. The driller takes risks always. I don't think they have paid for the new operations.

(Noon adjournment.)

278 Q. I wish to return for a moment to the subject of permanency of the supply of natural gas for the purpose of referring to certain matters that I had overlooked. I will ask you if you are acquainted with Mr. George Wardman, the author of an article on "The Fuel of the Future," published in the Popular Science Monthly in the year 1885.

A. No, sir; I am not acquainted with the author.

279 Q. I will ask you if you remember the article.

A. I have no distinct remembrance of it. I probably glanced at it at the time it came out.

280 Q. Are you accustomed to read the Popular Science Monthly?

A. Yes, sir; I have access to it always.

281 Q. Referring to the article entitled "The Fuel of the Future," by George Wardman, which appeared in the Popular Science Monthly in the year 1885, perhaps in the month of July, but copied into the Scientific American Supplement of July 11th, 1885, I desire to call your attention to the opinion as there expressed by him after referring to the historical facts relating to the supply of natural gas, in which he expresses an opinion as follows: "The value of the foregoing references is to be found in the testimony they offer as to the duration of the supply of natural gas. Whether we look to the eternal flaming fissures of the Caucasus or to New York, Pennsylvania, and Ohio, there is much to encourage the belief that the flow of natural gas may be, like the production of petroleum, increased rather than diminished by the draughts made upon it. Petroleum, instead of diminishing in quantity by the millions of barrels drawn from Western Pennsylvania in the
349 last quarter of a century, seems to increase, greater wells being known in 1884 than in any previous year, and prices having fallen from two dollars per bottle for 'Seneka oil' to sixty cents a barrel for the same article under the name of crude petroleum. Hence we may assume that as new pipe lines are laid the supply of natural gas available for use in the great manufacturing district of Pittsburgh and vicinity will be increased and the price of this fuel diminished in a corresponding ratio;" and, further, at the close of his article, where he says: "It seems, indeed, that until we shall have acquired the wisdom enabling us to conserve and concentrate the heat of the sun gas must be the fuel of the future." What would you say as to that opinion?

A. I should say that no geologist could have ever expressed such an opinion.

282 Q. Are you acquainted with Mr. J. P. Illsey, of Philadelphia?

A. No, sir. His name sounds familiar to me.

283 Q. I will suggest the connection in which his name has been prominently used and see if it occurs to you, he being a person employed to investigate the natural-gas question for capitalists of the East at the time the Philadelphia Company negotiated its securities and placed them on the market, in March, 1889.

A. I do not recollect anything distinctly in regard to it. I read the current literature of the day.

284 Q. Do you remember his name in that connection?

A. I have said I didn't recollect it distinctly—that is, not recalling it at all, I suppose—that is, I am not sure of the ground.

285 Q. I will call your *opinion* to the opinion as expressed by Mr. Illsley as the result of the investigation of the natural-gas question in that connection and his report on the subject, wherein he speaks as follows (being a report made by John P. Illsley, of Philadelphia, as the result of an investigation of the natural-gas question made for

the purpose of advising capitalists of the East, in March, 1889, an examination being made into the affairs of the Chartiers Valley Gas Company and of the Philadelphia Company in their business of supplying consumers in the city of Pittsburgh). I call your attention particularly to his opinion, as follows: "We hear of the exhaustion of the wells, but in all cases brought to my notice it was where wells had been drilled in a small field, as others sunk near them encountered water, or where the pressure at first was light; but in the fields described, where the drills encountered gas in first entering the sand rock and from the great pressure cannot be put lower, there seems every reason to expect an abundant supply to meet the requirements of all that region of country for many years. What is needed is greater economy in its use, for when we consider that the gas since its introduction has been taken from fields of much lower pressure than those now being drawn from, and that it has been under a greater pressure than was necessary to give perfect combustion—for now a pressure of four ounces per inch to small consumers and eight ounces per inch to the largest manufacturers is considered ample instead of the many pounds under which manufacturers have been wasting it—we can at once infer that the large territories just beginning to supply their gas under the enormous pressure of 500 and 500 pounds per square inch should be able to keep up the supply required by the Philadelphia Company for a long time to come. Therefore, so far as that company is concerned, it has today a better supply of gas and under a better pressure than it had three years ago, and so soon as it can define the boundaries of the territories it now draws from it can determine how much expenditure will be required annually to keep its supply up to the demand of its customers. I can but think that, with increasing receipts and diminishing expense, its days of greatest prosperity are yet in the future." What would you say to that opinion?

A. There are several opinions included in that. With the tenor of it I should dissent—that is, the general tenor—that the supply can be kept up and the great fields not being reduced. They are being reduced; they are lessening, and the pressure is going down and the whole field has gone down to the vicinity of two hundred to two hundred and fifty pounds, where it was originally eight hundred pounds.

286 Q. How soon after development commenced in the Murrysville field did the pressure begin to diminish?

A. I heard of it four years ago.

287 Q. Is that pressure still diminishing?

A. Yes, sir.

288 Q. Do you speak from your own knowledge or from hearsay?

A. From the testimony of those who are acquainted with the field. I have been through the Murrysville field, but I have not had a chance to make many tests.

289 Q. Do you not know as a matter of fact that the Murrysville field and the other Western Pennsylvania fields experienced a reduction in the pressure at the start and subsequently reached what

is called a flowing basis, and that for the past two or three years they have remained practically stationary?

A. That is not my best information. I have not had the freshest testimony in regard to that, but the pressure has been reported to me as failing steadily.

290 Q. What would you say if you should be advised that, from personal knowledge, perhaps seventy-five wells in the Washington county field showed practically no decrease in pressure, after reaching a point of about two hundred and fifty or two hundred pounds, for the period of a year?

A. It would speak very well for the field; that is a noble field, but a great many wells in that field, and the greatest ones, have gone dry, to my knowledge.

291 Q. Have they not put down wells by the side of them and got good wells?

A. Not equal to the original well.

292 Q. Not equal to the wells originally brought in?

A. No, sir.

293 Q. But you mean to say that they were not equal to the wells that had reached their flowing capacity?

A. I don't know what you mean by "flowing capacity." My opinion is that a well may be gradually receding, and oftentimes the rate is very slow; you can speak of it as being practically one thing for a year, but if you had gauges on it you would find, I suspect, all along a gradual reduction.

294 Q. You have not had an opportunity to observe in that field?

A. No, sir.

295 Q. You spoke this morning of the effect of one well upon another. I will ask you if you are familiar with what is known as the Farmer's well and the Findlay well, on the tract near the great Mellott well.

351

A. Yes, sir.

296 Q. Were you familiar with the facts connected with the bringing in of those two wells?

A. I heard the account, and I measured the Farmer's well after it was shot.

297 Q. Do you know the history of the well before it was shot?

A. Not minutely.

298 Q. Is it not a fact that Findlay had a well at that point, and that the Farmer's well was drilled perhaps thirty feet distant?

A. Yes, sir; very close.

299 Q. What was the capacity of the Findlay well before the Farmer's well was drilled?

A. I didn't have a chance to measure it. It was reported at eight million feet.

300 Q. Do you know what the capacity of the Farmer's well was when it struck the sand?

A. I think I gave that six million feet.

301 Q. I mean when it first struck the sand?

A. No, sir; I don't know that it was measured.

302 Q. Was it not a very light well before the shooting?

A. I remember now that it was shot. I was not aware that it was a light well.

303 Q. Were you present at the time the Farmer's well was shot?

A. No, sir; it was some weeks afterwards that I measured her.

304 Q. Do you know what effect, if any, it had upon the Findlay well, some thirty feet distant?

A. No, sir; I don't know.

305 Q. Suppose it should be the fact with this Findlay well, of perhaps eight million cubic feet daily, the Farmer's well was drilled within thirty feet and proves to be a very light well, and, upon boring deeper, it was no more productive and subsequently it was plugged with a leaden plug at the bottom and then shot, and no visible effect produced on the Findlay well, what would you say as to your theory of the effect of one well upon another?

A. Under those circumstances, all those conditions being met, it would be a surprising line of facts.

306 Q. Are you familiar with the Mellott well?

A. I know its location.

307 Q. Do you know the Harris well, across the road?

A. Yes, sir.

308 Q. How far distant is the Harris well from the Mellott well?

A. About three hundred feet, I think.

309 Q. It is across the road, is it?

A. Wait a minute. I was thinking of a well drilled immediately west of the Mellott well.

310 Q. That is the Toledo well. I speak of the Harris well, immediately north.

A. No; I don't recollect that location. Perhaps it has been drilled since I was there.

311 Q. Suppose a well were drilled not to exceed one hundred feet distance from the Mellott well, and—by the way, what is the capacity of the Mellott well, if you know?

A. The Mellott well, as given to me by the figures which were telegraphed to me, at twenty-eight million feet.

312 Q. Suppose a well were drilled within one hundred
352 feet of the Mellott well, and turned out to be a well having a capacity of from one to two million feet, what would you say?

A. I would say that the large well must be located upon lines of break in the rock. There must be crevices or fractures which allow a freer scope, which the small well near by does not directly reach.

313 Q. You have said in your direct examination that the Findlay field was rapidly becoming exhausted?

A. According to my information; yes, sir—that is, Findlay township proper. I mean the lower part of it, known as the original field.

314 Q. What about the Stewartsville field, so called?

A. That is a very fine field—equal to or exceeding in value the original Findlay field.

315 Q. What about the exhaustion of that field?

A. It has not begun to be developed yet. It is just sending out its first gas, I suppose, this fall.

316 Q. How far distant is the Mellott well from the field which you say is practically exhausted?

A. It would be four or five miles.

317 Q. Then the field which is practically exhausted is that lying in Findlay town?

A. In the town; yes, sir. The pressure runs down as you go northward from well to well, as far as I could get the facts. The pressure decreases as you go northward. The pressure in the Findlay field—rock pressure—is less than two hundred pounds when the wells are closed in, and as you go northward the pressure falls off until you come to 380 or 385 pounds in the Stewartsville field for the present rock pressure.

318 Q. Do you say that the pressure falls off?

A. No; the pressure increases as you go northward and increases in the other direction. I beg your pardon.

319 Q. The pressure increases as you go northward?

A. Yes, sir.

320 Q. Do you know the limits of the Stewartsville field?

A. No, sir. I think the Stewartsville field is gas territory all the way from the Findlay field. I think what we call the original Findlay field is one bed of porous rock which connects with the Stewartsville field. It comes northward to Van Buren without any apparent break, and still further to North Baltimore, and then it reaches off to the eastward, I suppose.

321 Q. Can you form any opinion as to the capacity or duration of the Stewartsville field?

A. Why, yes. I think we can apply the experience that we have had in the Findlay field to it. It is a district of the same excellent character—the same large production—larger, even larger wells than are found in the Findlay field; but it would seem to respond to the same laws and follow the same lines of behavior.

322 Q. Have there been any salt water wells or any oil wells struck in the Stewartsville field?

A. There has been salt water struck in the rock I understand.

323 Q. I understand you to claim that the salt water comes into the well drilled by the Cincinnati parties from the bottom of the porous rock—from the Trenton proper?

A. Yes. I have heard of salt water being struck at one or two points there, and that well is perhaps the principal one I have in mind.

353 324 Q. Were there any indications of this great gas field at Stewartsville prior to the developments of the drill?

A. Oh, yes; I think so. I always counted myself the territory due north there as a most promising territory, at least since the Van Buren wells were brought in. That came early. We had it all to learn in regard to gas in the Trenton at all.

325 Q. Was there announcement of gas in the Stewartsville field prior to the development of the drill?

A. Yes. I counted it all included; it is within the lines which I put as good territory. I don't know what I have written in regard to it.

326 Q. I understand that your map followed the developments of the drill largely.

A. I—my first map, if you go back to that—I didn't believe in high-pressure gas at Findlay before the driller found it there, and therefore I didn't believe in the high-pressure gas at Stewartsville, if that is what you want to get at. I think you had better make your question cover the whole field rather than Stewartsville.

327 Q. After the developments in the town of Findlay, I will ask you whether there was any location of the gas field by you or others at Stewartsville and Van Buren before the development of the drill?

A. Yes; it was to this extent the first well was drilled at Findlay, in January—December of that year, or January—and a well was brought in at Bowling Green and I connected the field by that north and south line in that early time, indicating that there was a field through that region there.

328 Q. But you were not able to locate the field at Stewartsville proper, as distinguished from the Portage field?

A. No, sir; but I counted it gas territory.

329 Q. And geology furnished you no information as to the location of the strong and the weak field?

A. No, sir.

330 Q. What do you say as to the permanency of the supply in the Stewartsville field?

A. Well, perhaps one single explanation will cover my belief in regard to that ground. I believe that the gas in all this Trenton limestone field is delivered under salt water pressure—I think that is the force that originates the pressure—that salt water is behind the gas in all the field, and that we can infer from the fields that have already been developed what the behavior of the rest will be.

331 Q. This first well which you have spoken of that was drilled at Bowling Green, do you know anything about the history of that well since?

A. Yes, sir.

332 Q. Do you know that it is still a good flowing well?

A. It is very small.

333 Q. Are not all the wells small in that district?

A. Yes; but they have fallen off very much from their original production.

334 Q. Were you familiar with the Simons well, in the Stewartsville field?

A. No, sir. In the North Baltimore field the Simons well was a very large well, brought in in 1885.

335 Q. There are several Simons wells?

A. Yes, sir.

354 336 Q. I refer to the first large one.

A. Yes, sir.

337 Q. Do you know anything about the capacity of that well?

A. No, sir; I measured it at the time. I have not measured it since.

338 Q. Don't you know that the supply of that well kept up right along?

A. No, sir; I don't know, and I don't believe it, sir.

339 Q. I will call your attention to a work on that subject, and I refer you to vol. 6 of the Geological Survey of Ohio, page 230, where, in speaking of this Simons well, you say: "At the date of its completion the Simons well produced a larger volume of gas than had yet been measured from any well of the State, the famous Karg well not excepted. The gas was measured, however, through the casing, which is five and five-eighths inches in diamater, while the Karg well was not measured until it had been tubed with four-inch pipe. The Simons well, if confined to a four-inch pipe, will be found to yield a little less gas than the Karg. It is thought to maintain its vigor undiminished."

A. Yes, sir.

340 Q. Is that your present information?

A. Why, no, sir. That was written two years ago, probably, was it?

141 Q. It is volume VI, completed at that time.

A. My work, I will say, was written by piecemeal. My volume was to have been published earlier than it was, and I wrote the accounts of the wells from month to month as I got the facts from them, and I have had to interpolate, and some of the statements I made wouldn't strictly be true at the last. I don't know but I called attention to that in the preface. I am not sure in regard to that, though. I have been obliged to cover the ground in installments. (Reads from preface, page 7): "The conclusions which larger experience has given will be found side by side to some extent with the earlier generalizations from a smaller and less important line of facts." I was obliged to be delayed. My volume was delayed by the failure of the bill to go through. That will explain some of those points; but I meant to say, I suppose, in that that the Simons well was counted as a very valuable well.

342 Q. "And maintains its vigor undiminished?"

A. Yes, sir.

343 Q. Now, do you know from actual measurement that this is not a fact?

A. No, sir; I had no opportunity of remeasuring.

344 Q. Do you know from actual measurement of any diminution of the production of the Stewartsville field up to this time?

A. No, sir; I don't understand that the Stewartsville field has been drawn upon until within the last three months.

345 Q. But if this field is all connected—if this gas lies in one great reservoir—how does it come that this immense draught made upon this field at Findlay and Bowling Green and North Baltimore and Van Buren and other towns has produced no effect?

A. I think it has produced effect. I think the pressure is lower at Stewartsville than it originally was.

346 Q. What evidence have you of that?

A. I have the evidence of the wells first drilled in the Van

Buren field. They had reached a higher pressure then than
355 the wells shown now, and show lower in the North Baltimore field. The wells showed a higher pressure originally than they do now. They ran from 430 or 440 pounds, and now they don't come to 400 in any case.

347 Q. Where is there a well that showed 430?

A. The Simons well showed more than that. I will not say just how much.

348 Q. Is it not true that there is a great deal of difference in the instruments with which the measurements are taken?

A. Oh, yes; there are possibilites of that.

349 Q. That would show fully that much variation?

A. Yes; there are errors, of course, of the instruments.

350 Q. And is it not true that the instruments at present for gauging and measuring these wells are much more accurate than they were a few years ago?

A. Yes, sir.

351 Q. Has it not been the result in all the territory, as the instruments improved, to show that the pressure was lower?

A. No, sir; I don't connect that with that. There have been in some cases a failure to begin with. You are right in the suggestion that much more care is taken in the measurements at the present time.

352 Q. You have said that gas is usually found in the largest quantities and under the largest pressure in the highest Trenton rock?

A. In the highest portions of the Trenton rock of the particular field—of the particular limitation.

353 Q. Do you know the depth at which the Trenton rock was struck in the Harris well, west of Stewartsville?

A. I have the facts in my possession. I don't know that I would dare to say; 1,140 it strikes me now.

354 Q. And was not that the highest point at which you struck gas in the Stewartsville field—in the Harris well?

A. I think not.

355 Q. Do you remember the exact depth at which they struck the Trenton there?

A. Not the exact depth. I had a memorandum of these figures and entered them in my records and didn't charge my memory with them all. Eleven forty is the figure that occurs to me now, but I may be in error there. I am quite certain that the level is not higher there than in other wells. It was a good well—three or four million feet, I think.

356 Q. That is below the average well in that field, is it not?

A. A four-million well is a very good well, but they have had noble wells there. I have not measured the Stewartsville wells personally.

357 Q. You have spoken of salt water being in the Trenton?

A. Yes, sir.

358 Q. Does that lie in the Trenton with the gas and oil, if oil exists?

A. It lies below the gas and oil in the porous part of the Trenton.

359 Q. Is that uniformly the case?

A. The porous rock is always filled with water—salt and fresh—and at considerable depth with salt water.

360 Q. Do you always find either gas, water, or oil?

A. Where the rock is porous, yes.

361 Q. Is that uniformly the case?

A. Yes; so far as I know.

356 362 Q. Is that true of the Pennsylvania field also?

A. I wouldn't dare to affirm so positively there, though I am persuaded that it is true there, but I have no experience there. The Murrysville field is followed by fresh water and the West Virginia field by salt water, but I believe the salt-water pressure does not follow at all closely in Pennsylvania and Virginia.

363 Q. They frequently get a dry well, don't they, by drilling into the Trenton?

A. They never drill into the Trenton in Pennsylvania.

364 Q. I mean here.

A. Yes, sir; here.

365 Q. How does it come that there is neither gas, water, nor oil?

A. The rock lacks porosity.

366 Q. How is that determined?

A. The drillings show that.

367 Q. Isn't it true that they frequently strike a porous rock and get neither gas, water, nor oil?

A. I think not. I have not known any such case with porous rock which is dolomite—a double carbonate of lime and magnesia—which seems to have replaced the Trenton limestone for twenty to forty feet near the surface, sometimes at the surface, sometimes covered by a little cap of true limestone. Where you strike the true limestone the well is dry. Unless you come to this replaced rock you get no production. Wherever the dolomite has come I have seen no exception. I have analyzed the rock of more than fifty wells in Ohio and Indiana.

368 Q. Have you analyzed the rock of the Pennsylvania wells?

A. No, sir; that is a sandstone; an entirely different thing.

369 Q. This pressure is due to a column of salt water, you think?

A. I am quite confident of that, but all geologists wouldn't agree with me.

370 Q. With this great pressure how do you account for the fact that you don't get a flowing salt-water well?

A. It raises to about 600 feet above the level of the sea in Findlay. If you go down to the Wabash Valley you will find salt water flowing. Here it raises in the casing about 600 feet, and the pressure upon every part of the field can be determined by adding 600 feet, which is a steady element, to the depth below the sea in which the Trenton is found. For example, in Findlay you will find the Trenton limestone 300 feet below the level, and adding 600 you have 900 feet normal rock pressure. There should be nine times sixty-seven; that would make 403 pounds. If you go to the St. Mary's field you lack one hundred feet and you throw off forty-seven

pounds. If you go to the Indiana field you will throw off twice forty-seven pounds.

371 Q. Then your theory of the pressure is based upon this column of salt water?

A. Yes, sir.

372 Q. Of course, if that should fail, if it should be shown that the pressure didn't exist, then your whole theory as to the pressure of the gas would follow also?

A. Yes, sir.

373 Q. You say that other eminent geologists do not agree with you?

A. Yes, sir; the matter has not attracted as much attention as it deserves. I remember of but one geologist that has written upon it, and that is Prof. Leslie, and he entertains a different view.

357 374 Q. The rock has been frequently pierced where this salt water is found, has it not?

A. Yes, sir.

375 Q. And has the pressure been relieved any by it?

A. The water rises.

376 Q. Does the pressure diminish?

A. The pressure on the gas field?

377 Q. Yes, sir.

A. No, sir; there is an ocean of that; it stretches out as far as the rock is pierced—under all Michigan.

378 Q. How is this ocean kept in the porous rock—separated by partitions so that the gas cannot escape?

A. There is a general permeability, with sometimes salt-water troughs between. Between the Portage field or the Bowling Green field and the Baltimore field there is a salt-water trough that runs between, as is shown by the surface rock as well, and water lime coming in there.

379 Q. But if there is this ocean of salt water which exerts this pressure——

A. That is a figurative term.

380 Q. Which means a large body of water?

A. Yes.

381 Q. Why isn't that same pressure exerted on the gas?

A. It is.

382 Q. Why doesn't it extend uniformly throughout the porous portion of the rock?

A. It does.

383 Q. How do you account for not getting gas at some points?

A. The rock is not porous.

384 Q. But you get water at the same point?

A. When you get below the level of the gas you will then come to the salt water.

385 Q. I am speaking of water in the gas rock.

A. Yes; I don't recall examples of the kind you refer to.

386 Q. You get salt water?

A. You get it when you go below the level of the gas, but in troughs, I imagine, almost always there.

387 Q. But there is the same pressure there?

A. Yes, if the rock is open and porous. These differences show themselves in the rapidity with which salt water rises. Sometimes you will find it rises as fast as the drill goes almost, and sometimes it comes in but slowly.

388 Q. It is true, as you have said, that you may drill a well which produces no gas, and right alongside of it you may drill another which produces gas?

A. Yes.

389 Q. And you account for that by saying that there may be porous or dense portions of the rock?

A. Yes, sir.

390 Q. How does it come that these portions of the rock are so dense that they will not allow the passage of gas, but will permit the passage of water?

A. You may go down below where the water belongs, in the lower level. You don't strike salt water generally at the top of the rock.

391 Q. Going the same depth, will you not sometimes get a gas well, and by drilling right alonside of it get nothing?

A. I don't recollect such an example.

392 Q. Do you remember the Tippecanoe well, in Findlay?

A. Yes, sir.

393 Q. And another well drilled east on the adjoining forty brought nothing?

358 A. Yes, but I should explain that by saying that they must have struck a fracture.

394 Q. How about the second well?

A. The fracture in the rock had communicated with a large reservoir to the Tippecanoe well and the other didn't strike any such good fortune.

395 Q. They got water?

A. Yes, I think they did.

396 Q. How did it happen that there was that high pressure of gas in one and practically no gas in the other, when water was found in both?

A. Of course, there are troublesome questions to answer in every such a case; you have to shape a general theory that will meet the largest number of facts that you can collect and base your theory upon them. If you look at a single case without any general law, you are lost in your investigation.

397 Q. Can you account for those facts?

A. I can see possible explanations, but I would like to know a great deal more than I do in regard to it.

398 Q. What is the elevation or height of Trombly, in Wood county, as compared with the surrounding territory?

A. About six hundred and fifty feet above sea level, or seven hundred.

399 Q. How high does salt water rise above sea level?

A. About six hundred feet.

400 Q. Do you know a well drilled about a half a mile east of Trombly, a salt well?

A. I visited one well at Trombly, but I think it was south that I saw it.

401 Q. The first well near by was southwest.

A. Then that I visited.

402 Q. That was burning a long time?

A. Yes.

403 Q. Do you remember that well?

A. I didn't visit it, I think.

404 Q. Do you know the fact that that well changed into a salt-water, flowing well?

A. I did not. I have known plenty of such cases.

405 Q. How do you account for the fact that this was perhaps a hundred feet above the height to which the column of water rises?

A. The gas lifts it up.

406 Q. Then the pressure of the gas is more than the pressure of the water?

A. The gas if it enters the well will lift the water.

407 Q. If the gas gets its pressure from the water, how can it have sufficient pressure to overcome that and lift the water?

A. There is this one vent and there is great artesian pressure upon it.

408 Q. Why don't the artesian pressure force out the gas?

A. It does; the pressure of the water is equal to the pressure of the gas. The gas has been compressed and is like a bent spring, and it comes into the column of water like a bent spring and helps the water out.

409 Q. Where gas comes out of the well it is forced out by hydrostatic pressure?

A. Yes, sir. The gas is forced out with the aid of the gas that has been put under pressure by the salt water and the salt water itself; its force is artesian pressure. The gas has been put under compression in the past history and is under a pressure of three hundred or four hundred pounds, as may be, and portions of that are escaping in the column and lifting the column. It is a very common experience that if you get a leak in a pump you can
359 raise water more than thirty-four feet, yet it is the column of air that holds the water up and brings the whole up with it. You may raise a column forty feet high if you get in a little air.

410 Q. The air fills what would otherwise be a vacuum?

A. Yes, sir.

411 Q. Are you familiar with the developments of the upper Sandusky field?

A. Well, I have kept track of them.

412 Q. How recent are those developments?

A. They began to drill there two years ago their first wells and have been going on until the present time.

413 Q. Their first wells were all failures, were they not?

A. No, sir.

414 Q. Practically failures?

A. The first wells in upper Sandusky; yes, and they have no success there yet; but the first well drilled in the field where they have gas was on the county farm and furnished gas for the county buildings and is going yet.

415 Q. They have drilled in a very large well recently?

A. Yes, sir; that is located in the central district between their other wells. It is in the centre of circle with their other wells around.

416 Q. Was this gas territory included in any of your maps?

A. Yes; it is in a possible territory. It is colored in the last map. I didn't quite reach the field, but I have solid color showing gas territory there. It was not in my earliest map.

417 Q. In any of your maps did you locate the Mercer and Auglaize county field before the development of the drill?

A. No, sir. I, however, had facts there quite early and my first map had some of the Mercer county wells in it, but not before the developments of the drill, of course.

418 Q. Did you in any of your maps or reports locate the Lancaster field before the development of the drill?

A. Oh, no, sir; that was a complete surprise to a geologist

419 Q. You have said in your direct examination that you considered the enterprise of piping natural gas to supply the inhabitants of a city as a very hazardous and uncertain enterprise?

A. Yes, sir.

420 Q. What are the elements of hazard and uncertainty?

A. The possibly short life of the field from which you draw.

421 Q. Anything else?

A. The intervention of salt water in the wells, but that would be connected with the first.

422 Q. The uncertainty of the supply is the only uncertainty?

A. Yes, sir.

423 Q. Do you know the extent to which capital is being invested in these hazardous and uncertain enterprises in Ohio?

A. Yes, sir.

424 Q. To what extent?

A. I have not the figures, but to a very large extent.

425 Q. I speak of the lines that are being constructed and have been constructed.

A. I suppose several million dollars are invested.

426 Q. Is that investment still going on?

A. Yes, sir.

427 Q. Is it on the part of inexperienced men—that is, men inexperienced in the natural-gas business?

A. No, sir.

360 428 Q. Is it on the part of men experienced in financial affairs and investments?

A. No, sir; not altogether. There are some, I think, of the companies that haven't had much experience in the natural-gas business. In the western part of the State they have not.

429 Q. It is true that those who are engaged in most of the larger ones are those who have had the largest experience in the development of gas and petroleum?

A. So I suppose; yes, sir.

430 Q. It is true that all of the large fields of Ohio are now used to supply gas for the purpose of piping to the adjacent cities and towns?

A. Yes, sir.

431 Q. Do you know how many lines there are constructed from this Findlay field to the surrounding towns and cities?

A. Yes, sir. I have not counted them. We have what you may call the Kenton line, to the south, from the southern extension of the Findlay field; we have the Tiffin line; we have the Fostoria line; we have the Northwestern line; we have the Toledo line. The two are now merged into the Northwestern, I believe.

432 Q. Are there not two lines to Fostoria?

A. Yes; there is a city line: yes.

433 Q. And two to Tiffin?

A. Yes, sir. I had forgotten that.

434 Q. Do you know of one being constructed now to Kenton?

A. No, sir. I was not aware that there was one going to Kenton, but I have heard of another line now going to Carey over to Bucyrus, and of a line going to Sandusky.

435 Q. Through to Fremont, Clyde, Belvue, and Sandusky?

A. Yes, sir.

436 Q. Are you not also aware of the fact that one of the lines to Toledo is being extended to Detriot?

A. I have heard so; yes; and I am sorry to hear it, too.

437 Q. Suppose those lines aggregate from two hundred to two hundred and fifty miles in length, including the line to Detroit, what would you say to that fact as showing the hazardous and uncertain character of the enterprise and investment?

A. Well, it bespeaks a good share of confidence in the resources of the companies that are doing this work, of course.

438 Q. If it is a reasonably prudent, business-like enterprise to construct a line from the Findlay field through to Toledo and sixty miles beyond Toledo to the city of Detroit, would you regard it as a hazardous and uncertain enterprise to stop at Toledo and supply gas there?

A. Not with the same sources at command at the end of the line where the gas is taken.

439 Q. Are the boundries of the gas field from which these pipe lines are constructed absolutely and certainly fixed?

A. No, sir; not absolutely. They are growing smaller in some ways.

440 Q. That is, the field is developing in different directions from what you laid down on the map?

A. Yes, sir.

441 Q. Are you familiar with recent developments in Henry township, Wood county?

A. No, sir. I have not got the facts from there.

442 Q. Have you heard of what is called the Priddy well?

A. I have only heard of it.

361 443 Q. That is wholly outside of the boundaries fixed by your map, is it not?

A. I am not sure. I have not got the location.

444 Q. Your line didn't extend beyond Henry township, Wood county, did it?

A. Oh, yes; my line extended there (indicating on map). All this blue color stands for possible production in the colored areas. The Trenton limestone is more or less productive of oil and gas.

445 Q. I refer to the west line of natural gas.

A. I put it over into that section there and a spur coming in here (map).

446 Q. Are you familiar with a well drilled by Smith Knight, west of Van Buren?

A. No, sir.

447 Q. Are you familiar with a well drilled upon property controlled by Judge Harmon, as trustee?

A. The Smith Knight—was it in section 11? I have the data for that. There is the Crawford well in section 11; there is a spur there.

448 Q. To what extent is gas being piped from the Mercer-Auglaize field?

A. It is being piped to Van Wert, about twenty-four miles; to Salina, eight miles, six or eight miles; to Lima, about twenty-five miles, 24 or 25 miles. I am not certain in regard to the figures; to Wapaconeta, some eight or ten miles, perhaps a little in excess of that, and then to several smaller villages; and then there is a line that goes down to Troy and Dayton through Pickaway. That is about sixty miles, I think.

449 Q. Is gas being piped from the Lancaster field?

A. Yes; gas is being piped from Hadley to Columbus, some twenty miles. Newark has a field tributary to itself; it is piped in from this field and it is only two or three miles; it is in Newark proper.

450 Q. Then it is true, is it not, that the lines from the gas fields in the State of Ohio to the neighboring cities and towns aggregate, perhaps, between five and seven hundred miles, and represent an investment of many millions of dollars?

A. Yes, sir; I have not footed up the mileage, but it is easy to do so.

451 Q. Do you know whether they are engaged in piping gas to Cincinnati?

A. I don't think there is any movement on foot for it.

452 Q. Do you know whether they are securing franchises for it in the city?

A. Yes, sir.

453 Q. But whether they have actually commenced the work of constructing a line you don't know?

A. I don't know. My impression is that there is nothing being done in that line.

454 Q. Are you familiar with the size of these lines as well as their length?

A. I know the general figures.

455 Q. Do you know of any line from a field to a city or town more than twelve inches in diameter?

A. No, sir; not in Ohio.

456 Q. What is the size of a majority of the lines in Ohio?

A. Eight to ten inches.

457 Q. Are you familiar with the extent to which gas has
362 been piped in the State of Indiana also?

A. In a general way. I have not been over the Indiana field for two years; most of the development has gone forward since that time.

458 Q. Do you know from what fields and to what prominent towns and cities it has been piped in Indiana?

A. It has been piped to Fort Wayne, to Wabash, to Peru, to Indianapolis, and to Richmond.

459 Q. To Frankfort?

A. I don't know of that.

460 Q. To Lafayette?

A. I don't know that it has gone to Lafayette.

461 Q. To Kokomo?

A. Kokomo is in the field.

462 Q. Are you familiar with the sizes of those lines to the places of which you have spoken?

A. No, sir; not very familiar. The lines have been built since I was in the field. I know the general run. It is eight and ten inch.

463 Q. Do you know anything about the piping of natural gas from the Indiana fields to Chicago?

A. I have seen the statement in the newspapers; yes, sir; that that was proposed.

464 Q. Are you familiar with the litigation growing out of the question of the right to pipe gas out of the State?

A. Yes, sir.

465 Q. Do you know that that was instigated in that connnection?

A. I don't know the history of it. Oh, yes; I believe I did know that. Louisville, Kentucky, was also interested in the same question. Louisville is drawing gas from the Indiana side.

466 Q. How far distant are the Indiana fields from the city of Chicago?

A. One hundred and twenty miles, I think; perhaps over.

467 Q. How far distant are the Indiana fields from Fort Wayne?

A. It must be forty miles, I would think; perhaps more.

468 Q. Are you familiar with the extent to which natural gas is being piped into Pittsburgh and the surrounding towns?

A. I don't know the distances. I know the different fields.

469 Q. Do you know the general extent?

A. Yes, sir; generally.

470 Q. To what extent is that being done?

A. Oh, there is an enormous interest in the supply of natural gas there.

471 Q. Is it not true that the investments in that business about Pittsburgh and the Western Pennsylvania fields represent millions of dollars?

A. Yes; many millions of dollars.

472 Q. And it is your judgment that all of this money is invested in hazardous and uncertain enterprises?

A. Yes, sir; I feel that there is that connected with it.

473 Q. Are they peculiarly so, or is it one of the hazards incident to the business?

A. It seems to me to be a peculiarly hazardous business, and that it is stimulated by the hopes of very large returns. It is in the line of many mining adventures.

474 Q. It does yield large returns?

A. I suppose it does.

363 475 Q. What has been your observation of the effect of this transaction of the piping of natural gas upon the communities?

A. It has given great stimulus to towns that have found their supplies near at hand.

476 Q. And increased the population and growth of industrial enterprises?

A. Yes, sir.

477 Q. Upon what theory would you reach the conclusion that an enterprise was specially hazardous and uncertain when its profits are large and its benefits are great?

A. My opinion is based solely upon the uncertainty of the supply.

478 Q. But the developments in the oldest fields where the piping has been done extensively have shown that the production increases with the demand, have they not?

A. I suppose more gas is probably going in now, though I am not sure that more is being produced than at first, but more is being used.

479 Q. Have you been able to locate in advance of the drill any gas territory in Ohio?

A. No, sir; I can't say that I have. I pointed out to the Kenton people, on indications of the surface rock, some territory in which they got rather a small and inadequate supply.

480 Q. Do you remember of delivering a lecture in the town of Findlay about the time of the drilling of the first gas wells there?

A. No, sir.

481 Q. Or a little before?

A. No, sir. I have spoken once in Findlay, but never alluded to the subject of natural gas.

482 Q. Do you not remember saying, either by an interview published in the papers or by personal interviews in the city of Findlay at the time they were making their first experiment and drilling for gas there, that the high-pressure gas would not be found?

A. I don't remember it, but it is entirely probable that I said it, for it was my conviction. I hadn't been in Findlay for several

years before, and probably some letter was addressed to me and I answered it to that effect.

483 Q. I speak not with particular reference to the place, but whether you did not express and entertain the opinion that no gas would be found.

A. No high-pressure gas.

484 Q. And that the little gas which came to the surface in the vicinity was simply shale gas?

A. No; I didn't have any such idea. I didn't know anything about the source of the gas there and didn't appreciate the fact of its occurring. I would say that a great many stories have taken rise in what I was supposed to have said in that connection. They all have an air of truthfulness, though, and it is just what I would have said, probably, and I say to you frankly that I had no faith in high-pressure gas at Findlay.

485 Q. There were the same geological indications and formations there?

A. Yes; but we didn't know how to read them.

486 Q. The same as are there now?

A. Yes; the Trenton limestone was a Findlay discovery. No geologist in the world had counted it as a source of high-pressure gas. Sterry Hunt had named it as a possible source of oil, but he didn't seem to have any opinion of it as a reservoir rock or a rock which would produce large quantities of oil or gas.

364 487 Q. Are you prepared to say that the Trenton is the only gas-bearing rock or sand underlying Ohio?

A. Oh, no; we have a number. We have the Trenton, the Clinton, the black shale, the Berea grit, and a half a dozen other horizons.

488 Q. Are you prepared to say there is no horizon or strata below the Trenton?

A. No, sir; I am not prepared to say that.

489 Q. Isn't it possible that in this entire field they may go through the Trenton and case it and still find gas-bearing sands or rock below?

A. It is possible.

490 Q. They do that in Pennsylvania?

A. Yes; only we are pretty near the bottom of the scale here. We are about a mile down, vertically, below. The Pennsylvania rock drillings have been carried eighteen hundred feet below the Trenton.

491 Q. In Pennsylvania they find it in several horizons?

A. Yes; to the depth of three thousand feet. The Pennsylvania depth does not matter, but the geological level does.

492 Q. To what depth below the sea level?

A. There must be some gas comes from over a thousand feet below the sea level.

493 Q. Much lower than any gas found in Ohio?

A. No, sir; we have gas which comes from more than a thousand feet below the sea level—the little field in Bryan and several of that character.

494 Q. I am speaking of gas in paying quantities.

A. Oh, yes; in large quantities; yes, sir.

495 Q. Was it not a settled conviction and theory of geologists in Ohio that no gas or oil would be found in Ohio at a greater depth than five hundred feet below sea level?

A. No, sir. That was a determination of mine from the experience of the first year. It was simply a deduction from the facts which were then in hand. The wells that had found the Trenton more than five hundred feet below had been found in salt water, but I didn't mean to extend that outside of the Findlay field.

496 Q. That was something like your deductions about the limits of the territory?

A. Yes, sir. All my deductions are based upon facts up to date. When I gave the five hundred feet limit for Findlay I was very well aware that gas and oil had been found at greater depths than the figure named.

497 Q. Can it be said with certainty that gas or oil will not be found at a depth of more than five hundred feet below sea level in Northwestern Ohio?

A. No, sir. Gas was found at Tiffin and Findlay and Bryan more than five hundred feet below the sea level, but they have not proved very valuable.

498 Q. Can any one say with certainty, until the deep boring has been continued further than it has in Northwestern Ohio, that a gas horizon may not be found below the present one?

A. No, sir; and after you have drilled a thousand wells you can't say that. Each well that is drilled means, of course, a probability less. You may go on and spend a million of dollars and it will still be true that some deeper horizon may be found.

365 499 Q. Of course, until that is done, you couldn't say, could you, that the Northwestern Ohio gas field is in the process of rapid exhaustion?

A. Why, yes, sir; I should not suppose that the gas that you obtain your supply from comes from these great depths. All the hints we get as to the rocks below would shut out a probability of that. I think it comes from beds tributary to the present horizon—the present productive rock; that these beds which are tributary are not found at these great depths. This Trenton limestone is about five hundred feet thick, and then we come to a porous rock in which we generally find salt water.

500 Q. Did the geologists of Ohio give any special indications as to the probabilities of development in that Cambridge field?

A. Yes, sir; I pointed out the arch to the people there, and they have spent considerable money upon it, and their supply now comes from the—a part of their supply comes from the arch that was located by the line of work that my survey brought out. Then I might take that little credit to the geologist, I suppose, for running the drill; it is of very small extent, however.

501 Q. Let me call your attention to your report on that subject, referring to the wells in the Cambridge field.

A. Yes; I speak in a discouraged way there, but just after that some better wells were brought in.

502 Q. Let me call your attention at the same time to what you said at that time after advising them as to the arch and after their experiment had been made on the advice given them. I will call your attention to what you say on page 379, vol. VI, Geological Survey, in which you write as follows: "All the hints and suggestions that geology has to offer have finally been appropriated, and three or four wells have been located on those parts of the arch that promised best. All of these have proved failures, and the inability of any geological knowledge now in hand to serve the great practical interest of gaining a supply of natural gas in this region has been fully demonstrated."

A. That was a little premature.

503 Q. "Until these last decisive experiments were made there was good ground to hope that when proper regard should be given to the facts of local relief that the level had shown to exist the gas rock would be found ready to respond with a paying production. The relief was recognized as very slight, though real, but when tested by the drill it was found ineffective for the purpose desired." (A. Yes.) "The first of these wells was located very near the tunnel in Cambridge by a citizen's company. The point selected was a proper one on an east and west line. It was a little less advantageous in the direction of the axis, but still was geologically more promising than any of the wells heretofore drilled in the town. The result did not in any way justify the forecast. The well was drilled to 2,000 feet and abandoned." And, further, on the following page, you say: "Explanations can, of course, be found for these failures, but the trouble lies in the fact that there — nothing but failures to be explained."

A. Well, they have something better than that now, and they located on my arch, after all.

504 Q. Then you have still further explanations of these failures, have you?

366 A. Yes, sir; you see I deal very frankly with these things. I do not claim any knowledge that cannot be verified. I did my best to point out to these people places which were chances for gas. The first three, four, five, or six wells were failures. They have got some—quite an abundant supply now, but they are located on the arch, all the same. I should express my judgment now in about those words.

505 Q. Let me refer now to the Lancaster field. It was the opinion of geologists in Ohio, was it not, that high-pressure gas in paying quantities could not be found in the Clinton prior to the development in Lancaster?

A. Yes; I think so, though the Clinton had been recognized as a source of oil and gas at first. The Fremont wells obtain all their oil and gas from the Clinton.

506 Q. But it was your opinion that gas would not be found in the Clinton in paying quantities?

A. I didn't expect gas in the Clinton in paying quantities.

507 Q. And your opinions were to that effect?

A. Yes, sir. If I made any expression it was to that effect.

508 Q. The wells were drilled at Lancaster to these depths, contrary to your opinion?

A. Yes, sir; they didn't drill for the Clinton. They started for the Trenton. I told them they would have to go to the Trenton. They followed on until they struck the Clinton.

509 Q. Your advice was that they would find nothing in the Clinton?

A. No; but that there was no known horizon that could be depended on, and the Clinton was included in that.

510 Q. They found gas in paying quantity in the Clinton?

A. Yes; a paying supply.

511 Q. I wish to call your attention to what you said on the subject of the Lancaster wells, on page 384, vol. VI, of the Geological Survey of Ohio, where, after recounting wells that had been drilled there, you say: "More recently the Clinton limestone has been found a source of gas and oil in Northern Ohio. The Fremont shallow wells derive their supplies from this horizon, and a well in Wood county has been already reported which produces thirty to forty barrels of oil per day from the same series. Still the discovery of so considerable a gas vein as Lancaster has obtained in the Clinton was altogether unexpected." (A. Yes, sir.) "The same series had been penetrated during the two preceding years scores of times in the counties to the west and north without realizing any value whatever, and the conclusion already stated, that but one horizon of gas belongs to one locality, was counted fully warranted by the facts. This conclusion is not really vitiated as yet, for, although Lancaster is located on the edge of Berea grit territory, this stratum has no apparent value here. It has, furthermore, been shown that the Trenton limestone loses its productive power in this portion of the State on two counts, viz., its chemical composition and its depth below the sea, involving also its lack of suitable relief. Under the circumstances the discovery of a new source of gas, large enough to be respectable in a field so well tested already, was certainly surprising." (A. Yes, sir.) "It seems to leave but little value to geological forecast."

A. Yes, sir.

367 512 Q. Has the value of geological forecast increased since that development?

A. No, sir; I don't know that it has—going before the drill.

513 Q. I also call your attention to what you said in connection with the Lancaster field concerning the theory that the better gas will be found higher on the dip or toward the summit of the anticlinal, and I read from page 385 of vol. VI of the Ohio Geological Report, concerning one of these wells at Lancaster, in which you say: "The well head was about twenty feet higher than the location on No. 1, but the gas rock was not reached until a depth of 2,020 feet was attained. In No. 2 the gas rock was found at a greater elevation than in No. 1, but in No. 3 more than sixty feet lower. The last well proves to be the best, a result which the present scanty

series of facts leave unexplained. The level at which it was struck would seem to place it at a disadvantage." How does that conform to your theory that on these anticlinals the better well is found higher up?

A. It is an exceptional fact; as I say, more knowledge would clear it away. If we could have all the facts we should see some explanation.

514 Q. More knowledge may show that instead of this field being exhausted we may have but just entered upon it?

A. I don't say that.

515 Q. Have the better wells been found lower down instead of higher up?

A. I should not feel warranted in drawing such an inference myself.

516 Q. You wouldn't draw such a general conclusion from such scanty facts?

A. No, sir.

517 Q. Have you ever undertaken to locate gas wells from the geological indications at the surface?

A. Well, yes; I think I may say that I have pointed out a few locations. I was glad to see drilling done at Sylvania. A number of people spoke with me in regard to that. There was a break in the rock there which seemed to me to warrant at least exploration. I named that in my first published report. You may say that was locating wells, to a certain extent. I located in the same general way. I advised the testing of the territory neat Grant station by the Kenton people. I told them they would locate more favorably at Grant station, indicating the surface rock. Then I indicated at Marseilles, in the edge of Hardin county. I don't think of other wells that I have advised especially. I was interested in those because there seemed to be some geological hints. Then the Cambridge wells—I located some of them on the principles that I recognized, although I didn't drive a stake.

518 Q. What were the developments?

A. There was nothing very favorable, sir; nothing very favorable.

519 Q. Was there anything at all favorable?

A. Yes, sir.

520 Q. Were there paying gas wells found at any time?

A. I suppose you would call some of these Cambridge wells paying wells. I hardly know whether the Grant wells are called paying wells. I don't think they would be. The Cambridge wells were the best, I think.

521 Q. Concerning the Sylvania field, you published a preliminary report or statement, did you not?

A. Yes, sir.

368 522 Q. It is not embodied in the 6th volume?

A. No, sir.

523 Q. You then published a supplement in 1887?

A. Yes, sir.

524 Q. Referring to the supplement of 1887 (which I have only in newspaper form, but published about April 15, 1887), I will call

your attention to what you have said concerning the Lucas county field and speaking of the extension of the Findlay break: "Northward, however, the line of the break is much clearer; it does not prove to be represented by a strictly continuous geological formation, but a few sags appear in it at various points. Barring these depressions, however, it can be said that a line of broken structure extends from Findlay to the Michigan border, which it reaches about two miles west of Sylvania. The break is quite as pronounced at this point as at Findlay. The descent to the westward is at least 200 feet in less than a quarter of a mile. The Findlay break passes a little west of Van Buren, in Allen township, through North Baltimore, and about two miles west of Bowling Green. Monclova, in Lucas county, is also on this or an altogether similar line." You remember that, do you not?

A. Yes, sir.

526 Q. Do you remember of making a report concerning the probabilities of the development of gas in the locality of Cygnet to some Columbus gentlemen?

A. No, sir; I do not. After I had published this—I made no report until I had published this, and after I had published this some friends of mine came to me and said they had been reading my report and were struck with the probabilities at Sylvania. I expressed to them my interest in seeing a trial made there, but I don't recollect any report.

527 Q. I didn't intend to speak of a written report, but were not these gentlemen advised in advance of the publication of this report of the discovery you had made?

A. No, sir.

528 Q. I refer to Mr. Deshler and his associates.

A. Mr. Deshler came to me and told me he had been reading my report. I gave no information in advance.

529 Q. Didn't they extensively lease lands in that vicinity?

A. I believe they did do some leasing.

530 Q. And didn't you, at their instance, several times visit that locality?

A. No, sir; not for them at all; no, sir.

531 Q. Did you visit it for others?

A. No, sir; I only visited it for the interest of the survey, and I took pains to put in your papers here the facts as soon as we found them. I thought there was some promise there, and I took pains to put them in the papers so that they would be common grounds. My Columbus friends got all the facts from my published volume. I went there repeatedly to study the facts for myself.

532 Q. Did you not locate the wells which were drilled?

A. No, sir; they advised with me as to where I would call it good territory. I told them to the east of the break, and the break shows by the quarries there.

533 Q. Do you know whether they located wells there subsequently?

A. They located one, I know, there, but other wells were drilled there.

369 534 Q. What was the development as shown by those wells located by the Columbus syndicate?

A. It was unproductive entirely. I believe they found a little bit of oil.

535 Q. Largely of salt water, was it not?

A. I didn't hear of salt water, but I presume so.

536 Q. They got no gas?

A. No, sir.

537 Q. To what depth did they go?

A. I think sixteen or seventeen hundred feet.

538 Q. Didn't they go two thousand?

A. Not to my knowledge. My record there, I presume, will tell—in vol. VI. Turn to the record of Sylvania and see how deep they were. I don't recollect the exact facts.

538½ Q. You also called attention to Monclova township?

A. Yes, sir; to the broken structure, in the paragraph which you refer to.

539 Q. Were there wells drilled there?

A. I know of wells being drilled near, but I don't know of any drilled there.

540 Q. What were the developments?

A. There was nothing found there, I think.

541 Q. Did you also indicate in some of your reports Waterville, in Lucas county?

A. Nothing more than what you have read. There has been a little gas found about Waterville; that was in the same line.

542 Q. I will call your attention to what you said at that time concerning Waterville. I read from page 225, under the head of Waterville, vol. VI: "This place seems to be, without doubt, on the line of disturbance and uplift that extends northward from Findlay to the Michigan line. A well drilled here in the summer of 1887 has aroused considerable interest from the promise it seems to hold out of valuable supplies of gas in the neighborhood." At the close of that paragraph you say: "A second well drilled near Waterville tends to dampen these expectations of a new gas field at this point, as it is reported unproductive."

A. Yes; you see I got these paragraphs from time to time and worked them in, my volume being held over.

543 Q. I am speaking of the value of geological forecasts.

A. Yes, sir; I understand that.

544 Q. I want to call your attention also to a paragraph with reference to Sylvania, in the same volume and on the same page: "At Sylvania, on the Michigan border, a section of unusual geological interest is found. Reference has been made to it in the preceding chapter. A notable flexture of the surface strata is found here. All of the facts at hand seem to point to this feature as an extension of the Findlay break. The survey has called repeated attention to this broken structure and has urged the desirability of testing this neighborhood, so long as indiscriminate and random drilling is going forward on all sides. It has been urged that such

structure could hardly be without effect in the concentration of oil and gas." It was without effect?

A. Yes, sir.

370 545 Q. "Drilling has recently been undertaken here and not by one company, as would have been prudent, but three or more wells are being sunk at the same time. The wells are not yet complete, but the records as furnished by the drillers are not only unexpected, but unintelligible. One thing, however, is clear, viz., the promise held out by the survey is not to be verified. Before this volume is completed it will be possible to present a summary of the facts that are now being gathered." Would those facts in any way confirm the theory advanced by the survey?

A. No, sir.

546 Q. You found the Trenton about four hundred feet lower than you expected?

A. Yes; the rock had pitched to the northward unexpectedly.

547 Q. In view of these facts which we have recounted—these failures—would you say that the geologist or the geological survey would speak with much certainty as to the probable future duration of the gas?

A. I don't consider that the failure to predict the suitable location of wells comes under the same head with the failure to draw inferences from the experiences of wells or from the behavior of the gas fields, as far as that is concerned.

548 Q. Your forecast as to the result of a particular indication was based upon facts?

A. Yes; based upon surface facts.

549 Q. And your prediction as to the failure of the field is based upon facts so far as they have been developed by the field?

A. Yes, sir.

550 Q. The facts known to you upon which you made your former forecasts were as certain as the facts now known to you?

A. The facts are facts, but I didn't have the same grounds of confidence. I couldn't have in regard to the nature of the underground formation as I could in regard to the behavior of the wells developed.

551 Q. Did you make these predictions with the same confidence as you did in referring to the finding of gas?

A. Do you refer to the exhaustion of the field?

552 Q. Yes, sir.

A. Yes, sir; I have very much more confidence. In those predictions I did not express great confidence; it was a suggestion that would lead to the testing of the territory.

554 Q. Is natural gas used for illuminating purposes in the State of Ohio?

A. To some extent; yes, sir.

556 Q. To what extent, if you know?

A. Well, it is not used in any cities that have had plants, to my knowledge—that had plants already established for artificial gas; but where a small village has got access to a gas supply they have used it for illumination.

557 Q. For both house and street illumination?

A. Yes, sir.

558 Q. Isn't it used in Findlay?

A. Yes, sir. Findlay is an exception; that and the smaller towns I have known. Their artificial gas plant gave out after natural gas was discovered.

559 Q. Does it not make a suitable illuminant with the incandescent burner?

A. It can be made to give good light with proper appliances.

560 Q. Do you know to what extent it is used in Indiana for illuminating purposes?

A. No, sir.

371 Re-examination:

1 Q. In the early part of your cross-examination you referred to the fact that natural gas had been known for ages past?

A. Yes, sir.

2 Q. Have you any knowledge as to whether the gas developed in times gone by was the gas that is now produced from what we call high-pressure rock?

A. I know of but few of the fields personally in which gas has been produced for long terms of years. The cases which I know are those which furnish shale gas only, and I infer from the records that I have read that all this gas is low-pressure gas exuding in springs and used in connection with salt wells.

3 Q. Your attention was specially called to a paper read by Charles A. Ashburner before the American Institute of Mining Engineers in 1887 and to an extract from that paper on page 12, where he refers to the supply of this gas as inexhaustible reservoirs. I will ask you to read in connection with extract to which your attention was specially called the context.

A. "The relative proportion of water, oil, and gas and the pressure under which they exist in the reservoir rocks must, of course, affect the amount of gas which can be obtained in any given time from a well, and also the duration of the well. This is too great a subject to be fully treated in this place; but it may be sufficient to state that the amount of gas which can be commanded per day from a given gas territory and the duration of the gas in the large gas districts, such as that surrounding Pittsburgh and in Warren county, Pa., and in the Findlay district, Ohio, will certainly be as great as has been claimed by Professors Leslie, Carll, Orton, and myself, who have given this subject the most careful consideration. That the bulk of the gas which can be obtained for commercial purposes now exists and is stored up in inexhaustible reservoirs I have no doubt; still, at the same time, there is a slow accretion to the supply constantly going on, which is a product of the continuing distillation of carbonaceous matter contained in the rocks. This product is — small, however, that it can hardly enter into consideration of the question from a commercial standpoint." I venture to say that the word "inexhaustible" —; as it seems to me that the word makes no sense with the rest of the sentence.

4 Q. If you can briefly I wish you would state what you consider the main difference between shale gas and high-pressure gas.

A. Shale gas of the lake shore, for example, is derived from the black carbonaceous shale that possesses a ratable percentage of petroleum distributed all through the mass. You drill into the rock anywhere and find a small per cent. of petroleum—one-tenth *one* one per cent., maybe, or one or two per cent, and sometimes more than that. That petroleum appears to decompose into a weak outflow of shale gas that is maintained, as in the Fredonia field, for generations, and wells will yield ten, fifteen, or twenty thousand feet of gas per day, as in the Fredonia wells, and down to fifteen hundred feet per day. On the other hand, the rock gas is contained in the porous rock and subjected to the pressure of salt water; at least it is always found associated with salt water.

372 5 Q. You have already expressed a decided opinion as to the durability of the gas wells in Northwestern Ohio. I think I understood, from some portion of your cross-examination, that you yourself had made measurements of various wells in the Northwestern Ohio field.

A. Yes, sir; I have made measurements.

6 Q. And is that opinion as to their durability based as well upon your own measurements as upon information you have derived from others familiar with that locality?

A. Yes, sir.

7 Q. Further referring to the Ashburner pamphlet, your attention was called to an extract from that pamphlet on page 10. I will ask you to read, in connection with that extract, the context as you did in the case of the previous extract.

A. "The tendency of natural gas, petroleum, and water, which are invariably associated, to some extent, in all oil and gas districts, to separate according to their specific gravities makes it essential that the dip of the reservoir rock and the position of anticlinals and synclinals shall be taken into consideration in locating oil and gas pools and oil and gas wells. If the reservoir rock were uniformly porous and homogeneous over the arch of the anticlinal, the crown of the latter being level and its cross-sections, transverse to its axis, being entirely similar throughout its extent, the best gas-producing territory would, of course, always be found on the crest of the anticlinal, immediately over the anticlinal axis, and the so-called anticlinal theory would always be a safe and unvarying guide for the location of a gas pool. Such conditions are never universal in any oil or gas district with which I am familiar." I accept all those statements.

8 Q. Are not those statements in conformity with the theories you have already expressed in your direct and cross examination?

A. Entirely so. I meant to cover that ground.

9 Q. Your attention was also called to Ashburner's Appendix, page 473 (Crew's treatise). I will simply ask — to state when that was written.

A. Mr. Crew has been dead for a number of years. I think it

was written about the same time as the Ashburner pamphlet. I see no date that would determine it.

10 Q. You have examined this report?

A. Yes; I am familiar, in a way, with Mr. Crew's volume.

11 Q. But there is nothing in that report to indicate when that appendix was written by him?

A. It is not far removed from the date of the report we have had, which comes in about 1887, I think.

12 Q. Your attention was called specially to paraffine and other obstructions retarding the flow of oil wells and of gas wells. I will ask you whether either paraffine or other obstructions retarding the flow of a gas well would diminish the rock pressure as measured at the mouth of the well.

A. I don't see how it should.

13 Q. The flow of a gas well, then, is not indicated by the rock pressure?

A. No, sir.

14 Q. To close, then, I will give you an opportunity to make
373 any explanation that you think it necessary to make not called out by the cross-examination or the redirect examination just made by myself.

A. Well, sir, I have gone over the ground pretty carefully, under the questioning of the counsel, and I do not know that I need make any statement in addition.

15 Q. Has there been any suggestion, either from the reading of your own reports or the reading of the reports of others, that would induce you to make any change in the statements and conclusions that you have arrived at in your deposition?

A. Oh, no, sir. I have had my own work, of course, directly in mind, and I am on the book as to that, and they know what ground I have taken—what ground I hold. My views are perhaps incorrect, but they are my own and they are settled to some extent.

16 Q. They are from your examination of the various fields that have been drilled?

A. I have based my conclusions upon the facts that I have obtained.

(The further taking of depositions herein is adjourned to Sat. a. m., Nov. 23d, 1889.)

374 SATURDAY A. M., *November* 23, 1889.

The further taking of these depositions resumed, in accordance with last adjournment, at the office of Brown & Geddes.

Present, representing complainants: A. W. Scott, Esq.
" representing defendants: Clarence Brown, Esq.

CHARLES L. STOCK, of lawful age, being first duly sworn by me, as hereinafter certified, deposes and says, by way of further cross-examination, as follows:

Mr. BROWN:

1 Q. You are the same person who has testified heretofore in this Toledo Natural Gas case?

A. Yes, sir; I gave testimony here some two or three weeks ago.

2 Q. How long have you been connected with the natural-gas business?

A. For the Northwestern Gas Co.?

3 Q. For any company.

A. I have been connected with the oil and gas business for about twenty-seven years.

4 Q. And where?

A. In Pennsylvania, and three years here in this city.

5 Q. How long have you been connected with the Northwestern Ohio Natural Gas Company?

A. About six years.

6 Q. With the Northwestern Ohio Natural Gas Company, I mean.

A. Well, it is a little over three years.

7 Q. What was the state of their work when you commenced to work for them in Northwestern Ohio?

A. We had only one well at that time.

8 Q. What was the stage of the work of construction of the pipe line?

A. We constructed a line from that well to the village of Fostoria.

9 Q. When did you come to the Northwestern Ohio natural-gas field?

A. In August, 1886.

10 Q. And have you been engaged continuously since that time in the field?

A. Yes, sir.

11 Q. What position did you occupy when you first went into the employ of the Northwestern Ohio Natural Gas Company?

A. The same as I do now. I had the superintendency of the wells and put in plants in those towns.

12 Q. You were superintendent of the field-work generally.

A. Yes, sir.

13 Q. Were you acquainted with the wells drilled by the Northwestern Company from the time you came here down to the present time?

A. Yes, sir.

14 Q. Where was the first well drilled by the Northwestern?

A. Well, I am perhaps a little bit ahead of my story. The first well, I believe, was drilled by the Fostoria Company.

15 Q. I meant where was the first well drilled after you came.

A. I was just thinking whether the Northwestern—where they commenced to drill after I came here, but I think the first well drilled by the company was in Portage township, and I can't name the section.

16 Q. Can you name the owner of the property?

A. Mr. Wickenheiser.

17 Q. In Portage township, of Wood county?

A. Yes, sir; now, I think that was the first well that the company drilled.

375 18 Q. What was the capacity of that well when it came in?

A. It was no good.

19 Q. How many wells did the Northwestern Company have when they began the first work of constructing the first line?

A. I got this subpœna last night about 11 o'clock, and the information that you probably want to obtain from me belongs entirely to my employers, and I have had no chance to say anything about that to our general manager, and I wouldn't be willing to give up any information about their business without their consent.

20 Q. Do you decline to answer?

A. Yes, sir; without more time to consult with my employers?

21 Q. How much time will that require?

A. I couldn't say. It is hard to tell where they are—where I might find them.

22 Q. Where is your principal office?

A. Oil City is the general manager's office.

23 Q. Who is general manager?

A. C. N. Payne.

24 Q. Where is the principal office of the company?

A. I suppose it to be in Toledo.

25 Q. Don't you know?

A. I suppose it is Toledo.

26 Q. Don't you know?

A. Well, no; I can't say that I do.

27 Q. Who is your next superior officer?

A. Mr. Tomkin.

28 Q. Where is he?

A. He is in the State of Kansas.

29 Q. Is he temporarily absent, or has he left?

A. Yes, sir; temporarily absent.

30 Q. Whom do you make reports to in Mr. Tomkin's absence?

A. To Mr. Payne.

31 Q. Have you any connection with the Toledo office?

A. No, sir.

32 Q. You make no reports to the Toledo office at all?

A. No, sir.

33 Q. Where are Mr. Tomkin's headquarters?

A. At Toledo.

34 Q. Don't you report to him at Toledo?

A. Sometimes I telegraph. If I want some supplies I notify him.

35 Q. Don't you have business transactions with the Toledo office?

A. No, sir; not any more than sending in a pay-roll.

36 Q. The office in Toledo is the general office of the company, isn't it?

A. The general offices of the company, I suppose; yes, sir.

37 Q. Who is the president of the Northwestern Ohio Natural Gas Company?

A. Governor Fostor.

38 Q. Where does he live?

A. He lives in Fostoria.

39 Q. Have you had any instructions from your employers since you testified here?

A. No, sir; not any.

40 Q. Had you any instructions at that time as to your testimony?

A. No, sir; not any.

41 Q. Why did you then respond to the subpœna and give your testimony?

A. Because the questions you asked me were not the questions you were about to ask me; it was not properly testifying to the company's business. You now propose to ask me about the life of the wells.

376 42 Q. Have you any objection to testifying to the life of the wells?

A. I am willing to give you my opinion, but I am not willing to give any of the company's business away unless I am satisfied that I should do so.

43 Q. You are not willing to back up your opinions by the facts showing that the wells have given out?

A. I don't know that wells have given out.

44 Q. You testified to that?

A. To my opinion.

45 Q. Your opinion is not based upon facts?

A. It is principally.

46 Q. You testified that wells were giving out?

A. Yes, sir.

47 Q. You say you never knew of one giving out?

A. We have had no wells give out—not here. Any of the wells we have drilled within the last three years haven't given out; that is what I want you to understand. They are not as strong as they were two years ago. They have not been abandoned; that is what I want to say.

48 Q. You have stated in your direct examination that you measured the rock pressure and supply of gas wells in the Northwestern Ohio territory during the last three years?

A. The rock pressure; yes, sir.

49 Q. And the supply also of the wells?

A. I don't remember about that, but I presume I did. I don't remember of speaking anything about the size of the wells.

50 Q. I will refer you to your testimony on page 78, question 12, in which the question is asked you: "I will ask you first, before you begin to make your statement, whether you have made measurements as to the rock pressure and supply of those wells," and to which you answered by saying, "Yes."

A. Yes, sir.

51 Q. You have made measurements of the rock pressure and the supply of wells in the Northwestern —— field?

A. Yes, sir.

52 Q. What wells?

A. Well, a number of wells. I have measured the capacity and the rock pressure of almost all of the wells that we have.

53 Q. Of the Northwestern Company?

A. Yes, sir; and some other people's wells.

54 Q. You say that about three years ago, in further answering this question, that you had a well that would show in three minutes 450 pounds?

A. Yes, sir.

55 Q. What well was that?

A. That was the Godsend.

56 Q. Now, you say you have a well drilled since that time, about a year ago, in the same neighborhood, that showed 245 pounds?

A. Yes, sir.

57 Q. What is that?

A. It is drilled on the Perrine farm. We have got no name for the well; on the Perrine farm, in that neighborhood.

58 Q. You have stated further in answer to a question that there has been a diminution of the pressure of that amount in that locality?

A. Yes, sir.

59 Q. Did you get that from the measurements of any others than those two wells?

A. Yes; I got that from the wells generally—from the wells in that locality.

60 Q. What locality is that?

A. That would be in the edge of Perry and Bloom townships.

61 Q. In Perry township, Hancock county?

377 A. No; In Perry township, Wood county, and in Bloom township, Wood county. Well, it would reach over into Hancock, too. There is the county line there, and some of those wells reach over into Hancock county.

62 Q. Is this on the eastern or on the western side?

A. It is on the eastern side of Bloom and on the western side of Perry.

63 Q. Was this 225 pounds in the well measured about a year ago taken for three minutes, the same as the one before?

A. No, sir; it took twenty-five minutes to raise that pressure; I think it was twenty-five minutes. I can tell by some notes that I have (refers to book); twenty-five minutes. Now, you understand how this was, do you?

64 Q. Yes; is it not true that that does not always arise through the lapse of time, but that you may take one well and measure it and it will run up to a certain pressure for three minutes, while another well in the same field at the same pressure will take four or five times as long?

A. Yes; it is according to the capacity of the well; they all rise to the same point.

65 Q. The capacity of the well is not determined by the rock pressure?

A. No, sir.

66 Q. Then this mere fact that it takes one well three minutes to show 450 pounds and another well twenty-five minutes to show 225 pounds shows that the well is diminished in capacity?

A. That well that showed 450 in three minutes wouldn't show three hundred pounds to-day in twelve hours.

67 Q. Wouldn't now?

A. No, sir.

68 Q. But that pressure alone wouldn't determine the capacity of the well?

A. That pressure shows that the pressure is going off the field; that the rock pressure is going off the field; that the capacity of the well is growing smaller.

69 Q. Don't some of the smallest wells in the field have just as high a rock pressure as the largest ones?

A. Yes; but the capacity of the well is what raises the rock pressure quick or is a long time in doing it.

70 Q. When was this Godsend well measured last?

A. In August—last August.

71 Q. Is that the measurement you have given here?

A. Yes, sir—that is, you have the measurement there, have you?

72 Q. Yes; how long has that Godsend well been in use?

A. That Godsend well has been in use—it will be three years the 25th of next December.

73 Q. And in what connection has it been used?

A. It has not been used continually; it has been shut in a part of the time. It has been used for Fostoria.

74 Q. Wasn't it one of the first wells connected with the line?

A. Yes, sir.

75 Q. And hasn't it been connected with that line practically all the time since?

A. Certainly, but not turned in the line.

75 Q. What portion of the time has it not been used?

A. There has been in the summer season now three years. There would be probably one year of that time that the well was not in use.

77 Q. Was it connected with any other line than Fostoria?

A. Oh, yes; our lines are all connected.

378 78 Q. When this well was shut off from the Fostoria line was it turned in onto any other line?

A. No, sir. There was a well drilled at Bloomdale and finished before this well; that is hearsay; I don't know.

79 Q. I speak of your company.

A. Well, this well was not drilled by our company.

80 Q. It was one of the first wells drilled there?

A. Yes, sir.

81 Q. Isn't it true that for quite awhile it was the only well used to supply Fostoria?

A. Oh, no; before the lines were put in we had other wells drilled on that same farm.

82 Q. Wasn't this well used alone?

A. No, sir; she wasn't a large well.

83 Q. Are all of these other wells in that district still in use?

A. Still in use; yes, sir.

84 Q. What was the capacity of that well when it was first turned in?

A. The Godsend?

85 Q. Yes; when it first came in.

A. I didn't measure it. The measuring of wells by the million was something I didn't know anything about until I was here for some time. It was reported by the man superintending the gas works that it was a three-million well, but, of my own knowledge, I knew nothing else about it.

86 Q. How many wells besides the Godsend did you have connected with the Fostoria line at that time, while you were using the Godsend?

A. I don't remember how many wells we did have in at first.

87 Q. Approximately.

A. Well, I think we had about four.

88 Q. What was their capacity as compared with the Godsend?

A. I never measured any of them to get the number of cubic — at that time.

89 Q. From the pressure what would you say was their capacity as compared with the Godsend?

A. I couldn't tell you; the territory was new. At that time the pressure would raise quick—in new territory—even if the well was small. I think they were pretty much like the Godsend. I don't think there was much difference in two of them. My judgment would be that they were very near alike. They were drilled within a half a mile of each other; very close together.

90 Q. You say there is a diminution in the pressure in all that territory down there. What diminution is there?

A. There is a shrinkage in pressure from 450 to 375.

91 Q. Within that time has this shrinkage occurred?

A. A year ago now we could get four hundred and ten pounds at Van Buren, and now we only get three hundred and seventy-three.

92 Q. Does this apply to the Stewartsville field?

A. Yes. I was surprised at that.

93 Q. And where your wells are?

A. Yes, sir.

94 Q. Does the Stewartsville field include the Mellott territory, so called?

A. Yes, sir.

95 Q. And your statement includes the Mellott well?

A. Yes; that is what surprised me, and when I put the gauge on I expected to get a pressure there.

96 Q. That is the well upon which you base your statement that the pressure is 375 now?

A. Yes, sir.

379 97 Q. What is the comparative capacity of these wells in the Stewartsville field with what they were one year ago?

A. There were no wells there a year ago.

98 Q. Compared with what they were when the wells were first discovered in the Stewartsville field.

A. That I don't know.

99 Q. Were you familiar with the capacity of those wells in that field?

A. Yes; as far as our wells went; more particularly about Van Buren. There were no wells at Stewartsville a year ago now, I think.

100 Q. The wells at Stewartsville were there last winter?

A. There is a well on what they call the tube works, on the Skinner property, that has been down—how long—I don't know just when it came in, but I was never over there to take the pressure.

101 Q. Don't you know the brick-yard well in Stewartsville?

A. I think it has been in for some time. That is a small well—that is, I heard it was when it was new.

102 Q. The Mellott well has been in since last spring?

A. Yes, sir.

103 Q. Nearly a year?

A. I think it was in March when it was finished. I am not positive.

104 Q. It was in the spring of 1889?

A. Yes, sir.

105 Q. And other wells were drilling at the same time as the Mellott well?

A. Soon after that they commenced to drill.

106 Q. And a number of wells came in shortly afterwards?

A. Yes, sir.

107 Q. Were you familiar with the capacity of those wells in that field?

A. Some of them.

108 Q. What is the capacity of those wells as compared with what it was in the spring, at present?

A. I wouldn't think there was any great amount of difference, because there has been no great amount of gas taken away from there—only what Findlay has taken.

109 Q. Are you not taking gas from there?

A. I couldn't say.

110 Q. Didn't you connect up the Mellott well long ago?

A. Yes, sir.

111 Q. Didn't you connect that up last June?

A. No, sir.

112 Q. Has there been any dimunition in the capacity of any of the wells in the Stewartsville field, to your knowledge?

A. There has been this—you press for that question? One of our wells has shown a decrease in closed pressure within the last six months; quite a decrease in one of our large wells.

113 Q. In the Stewartsville field?

A. Yes; it is at Van Buren.

114 Q. How long have the wells been in use at Van Buren?

A. They have been in use for two years.

115 Q. I speak now of the Stewartsville field proper—the territory immediately about Stewartsville, including the Mellott, Skinner, and the brick-yard well, and the wells in that locality.

A. This well on the Skinner—I don't know how much that was used.

116 Q. Do you know yourself of any diminution in pressure of any well in the Stewartsville field proper?

A. I can't say that I do.

380 117 Q. Do you know the capacity of any of the wells in that field?

A. Yes, sir; quite a number of them.

118 Q. What ones, to your knowledge?

A. I know the capacity of the Mellott and the number one on the Skinner——

119 Q. The Toledo?

A. I don't know whose it is. It was drilled by Neiss & Ross.

120 Q. Where is it located with reference to the Mellott well?

A. One hundred feet from it or thereabouts.

121 Q. What is the capacity of those wells?

A. The capacity of that well when I took it was about five millions and a half, after being shot.

122 Q. That is the Skinner well?

A. It was a little over three million before being shot.

123 Q. How long ago was that taken?

A. Right away after the well was finished, and I can't say now when that was. It was some time in the summer.

124 Q. Have you taken the capacity since?

A. No, sir.

125 Q. What was the capacity of the Mellott well?

A. Twenty-eight millions.

126 Q. When was that taken?

A. That was taken before the well was tubed, thro' the casing. I can't give you the date.

127 Q. About how long ago?

A. I think it must have been in March.

128 Q. Was that taken by you?

A. Yes, sir.

129 Q. Have there been wells drilled immediately across the road from the Mellott?

A. Yes, sir.

130 Q. Do you know the capacity of those?

A. I don't know; no, sir.

131 Q. Do you know what they are reported to be?

A. Yes; the well immediately across the railroad is a very light well. Mr. Harris, the owner, told me he thought she wasn't over a million and a half.

132 Q. Do you know the farmer's well across the road?

A. Yes, sir.

133 Q. Did you ever measure that?

A. No, sir; they reported the capacity of that as two millions.

134 Q. Do you know the capacity of the second and third wells on the Skinner tract?

A. No, sir.

135 Q. Has there been any diminution in the capacity of those wells in that vicinity, to your knowledge, from any cause, of those wells?

A. Not that I know of. There is a batch of little small wells in there, as well as good wells.

136 Q. Referring again to your direct examination, on page 79, No. 15, you were asked, "Does your experience in the gas field teach you that there is a limit to the supply of any gas well yet discovered"? and you answer, "Yes."

A. Yes, sir.

137 Q. What is the limit?

A. It varies, according to my knowledge of wells before I came to Ohio. I have known a large well to run down in two years, so that she was practically worthless to put in a line and send gas for any distance, and I have known wells to last for four years and be pretty good wells. What I mean by that is this: a large well, that we couldn't get tubed, in two years' time we could tube with a two-inch pipe, for she only showed a pressure of 120 pounds. She was
381 one of the largest wells drilled in that section, in Pennsylvania. The owners of that land didn't own the surrounding land, and they went in there and drilled just as thorough as they could, and the result was in two years' time they had nothing.

138 Q. Can you fix any definite limit to a well?

A. You can't fix any definite limit when the gas will go out of a well if the well is kept dry, but if salt water gets in there she goes out right away.

139 Q. How do you keep salt water out of a well?

A. When once it gets in, unless it comes in at the bottom, I don't know that you can keep it out unless the pressure of the gas is strong enough to throw it to the top every time.

140 Q. Do you maintain a back pressure on the wells for the purpose of keeping out salt water?

A. I don't open the well up wide; no, sir.

141 Q. What is the back pressure necessary to keep on a well to keep the salt out?

A. I don't know that.

142 Q. About what is the pressure usually maintained?

A. My idea would be, that the more pressure there is kept in the well, the longer the well would last; but, of course, in order to supply a line with gas you would have to almost give that line the rock pressure if you was going to carry it any distance—your gas, to carry it any distance.

143 Q. You say in your former examination that from your knowledge of the gas business you would say it was very hazardous to try to conduct a volume of gas thirty or forty miles for any particular length of time?

A. Yes; that is my opinion.

144 Q. Why?

A. Because the wells are short-lived, and it certainly would be a hazardous business for a man to go into and invest his money in, unless he was sure of a large amount of gas to supply his line. Now, there is no man sure of that.

145 Q. Then you think that all those enterprises going on here in Northwestern Ohio are very hazardous?

A. I certainly do.

146 Q. How many lines are your company building at the present time?

A. I don't know.

147 Q. Haven't you anything to do with that?

A. Not outside of the field.

148 Q. Don't you know they are extending the line from Fremont to Sandusky?

A. I have heard so.

149 Q. And from here to Detroit?

A. I have read such a thing in the papers.

150 Q. Do you know about how many lines are being constructed to the Findlay field?

A. I don't know.

151 Q. Your company has two to Toledo?

A. We have always had one, and I have heard or read in some paper that they had the other one. I have had nothing to do with the other line, so far.

152 Q. You have a line to Tiffin, have you not?

A. They had a line to Tiffin. I heard that our company had that line, but now I don't know anything about it of my own knowledge.

382 153 Q. You have a line to Fostoria?

A. That I know; I laid it myself.

154 Q. And one to Fremont, Clyde, Bellevue, and Sandusky?

A. I know nothing about Clyde, Bellevue, and Sandusky. I know of the Fremont line and of the Toledo line and of the Fostoria line.

155 Q. Do you know that there is another line to Fostoria besides yours?

A. Well, I guess I do. I think I saw them laying that line.

156 Q. Isn't there another line to Tiffin besides yours?

A. I don't know that.

157 Q. Do you know anything about a line to Kenton?

A. No, sir. Do you mean from our field to Kenton?

158 Q. From the Findlay field to Kenton?

A. I don't know anything about that.

159 Q. Do you know about the line to Bowling Green?

A. No, sir.

160 Q. You don't know whether Bowling Green is supplied with natural gas?

A. I do not. I never was in the place.

161 Q. Or North Baltimore?

A. I have been to North Baltimore. They appear to burn gas there rather lavishly.

162 Q. You have the entire charge of the field, have you not, for the Northwestern Company?

A. I expect they think so.

163 Q. Don't you understand you have?

A. I never have been instructed that I had full charge of the field.

164 Q. Is there anybody over you in the field?

A. No, sir; I merely go on and do the things that I see that want doing.

165 Q. Are you drilling wells in the field?

A. Once in a while we drill one.

166 Q. Are you not making preparations at this time for your increased lines to Sandusky and to Detroit?

A. We have made some preparations, of course. The com. had a large well down there. They didn't just exactly buy that well and let it stand there and waste away; they laid a line to it and took the gas away from it.

167 Q. To what well do you refer?

A. To the Mellott well.

168 Q. That is connected up to the line already?

A. It has been connected for about a week or ten days; probably about ten days. This I know, because I connected it.

169 Q. To which line?

A. That was connected to the two lines.

170 Q. Which ones were they?

A. Both the ten-inch.

171 Q. Those are the two Toledo lines?

A. Yes, sir.

172 Q. Are there any other wells connected with the Toledo lines?

A. Yes, sir; we have wells connected to the lines.

173 Q. I mean to the Toledo lines?

A. Yes, sir.

174 Q. Turned in?

A. I don't know about that to-day.

175 Q. Isn't it true that the Mellott well has been furnishing the two Toledo lines since it was connected?

A. No, sir; there is not a shadow of a truth in that—in any such a story.

276 Q. How many more wells are connected with the Toledo lines?

A. Probably forty.

177 Q. And turned in?

A. We put the wells on just as the pressure is required,
383 just exactly. You ask me how many wells are turned in. I couldn't tell you, nor no other man could tell you.

178 Q. You are the person who is in charge of that, are you not, there?

A. Yes, sir; but I am not out in the field in the middle of the night. Sometimes I am there late, and I know just what wells are on. When I am there I generally know what wells there are on a certain line, but the lines take care of themselves, kind of. We have telegraph operators there, and here, and when they need a little more gas they telegraph. It is not directly under my supervision.

179 Q. What is the average number of wells turned into the Toledo line each day, in addition to the Mellott?

A. Well, not less than ten.

180 Q. What would you say was the aggregate capacity?

A. Now, I think—I don't think there is less than ten wells, but, as I told you before, they are not in all the time. At the night time the Mellott well must be shut up.

181 Q. Why?

A. The pressure raises—that is, when shut off here. Here is a pressure coming up on the high side of your regulator in the main line, and you shut off wells to keep your pressure down.

182 Q. And the Mellott, being the greatest, that pressure has to be taken off the line?

A. Certainly. That well raises the pressure so much faster than any other well. We have to shut the Mellott well off.

183 Q. What would you say was the aggregate capacity of the ten wells, perhaps, connected daily besides the Mellott?

A. I couldn't answer that. I don't know.

184 Q. Will you state approximately? I don't expect you to be exact.

A. No; I don't think I could, because some of those wells I am not acquainted with. They belong to the other company, and I don't know what they are. I don't have charge of them. I have not got over there yet.

185 Q. In what field are they?

A. Those wells are part of them in Hancock and part of them in Wood county—I don't know but they are all in Wood county. I think, probably, they are all in Wood county.

186 Q. In Bloom township?

A. Mostly in Bloom township.

187 Q. In the north or south part?

A. In the south part.

188 Q. Do those wells in the south part of Bloom average above three million?

A. Yes, sir. The average of the wells in Bloom township, as far as I know—those wells I am talking of now—they belonged to the old Toledo Company. I don't know what they average, but I mistrust there is some of them very good wells; but the wells I know, they would average over three million.

189 Q. How much will they average—the wells in Bloom township?

A. I think in all probability our wells in the south part of Bloom township would average four millions.

190 Q. Do you speak of those from your knowledge of the wells for two or three years?

A. Yes; I measured all of those wells.

192 Q. What was their average when they were first struck?

A. Well, the average of the wells would be considerably more than they are now, when they were new.

384 193 Q. Is that based upon measurements taken then and now?

A. That is by our employés. Not exactly; no, not measurements taken by our employés now.

194 Q. But from a diminution of the rock pressure?

A. Of the rock pressure.

195 Q. You conclude that?

A. Yes, sir.

196 Q. I don't understand you to say that you have made measurements recently to ascertain that?

A. Not within six months.

197 Q. You speak of its being necessary to turn off some of these wells, and particularly the Mellott. About what time is it necessary to turn off these wells and reduce the pressure?

A. It is according to the consumption here in town, according to the temperature of the atmosphere. There is no particular time when they are turned off.

198 Q. Isn't it true that along about six or seven o'clock, when the factories are turned down and other kinds of business stop, that the pressure runs up?

A. Certainly. Whenever you shut off the consumption your pressure will start up.

199 Q. Isn't that about the time it occurs, along at six or seven o'clock?

A. It would be some time in the evening when they would be obliged to shut off some wells.

200 Q. When do you find it necessary to turn them on again?

A. When would you think?

201 Q. I should think along about five or six o'clock in the morning.

A. It is nearer midnight.

202 Q. That is when the consumption begins to increase, does it?

A. In order to maintain your pressure, you have got to commence very early, before they begin to draw off. If they ever get the start of you, you never can get the pressure up.

203 Q. In order to have the pressure here at the time the increased consumption begins, you turn your wells in again at what time?

A. From two o'clock—along about two o'clock in the morning—from two to three o'clock. It depends entirely upon the state of the atmosphere—the weather.

204 Q. Do you know what the capacity of the two Toledo lines is?

A. Not exactly.

205 Q. Approximately?

A. What they deliver here?

206 Q. Yes.

A. That would be owing to the pressure.

207 Q. Upon any given pressure—with the average pressure?

A. We disagree somewhat about that—that is, some of us. I claim that we don't supply Toledo with more than fifteen or twenty million feet of gas out of the Northwestern line.

208 Q. How do you arrive at that conclusion? What is the basis of your computation?

A. It is the number of fires and the pressure carried here—the amount of gas. While it is a guess, of course, it is the amount of gas

consumed in the city. Of course, it is guess-work, but I think I come pretty near to it.

209 Q. What I want to know is whether you reach this conclusion by the information of the number of fires, and so forth, or whether you reach it from the size of the line and the pressure?

385 A. I reach it from the number of fires; that is guess-work, about the number of fires, and the size of the lines also, and the pressure carried in the city.

210 Q. Can you tell what the capacity of a ten-inch line, about thirty-six miles in length, is with any given pressure which you may name?

A. I don't think I could tell that.

211 Q. You can't make that computation?

A. No, sir; I don't think I could.

212 Q. What is the pressure maintained here at the city?

A. I don't know what they do carry here now.

213 Q. Generally?

A. I think they intend to carry one hundred pounds.

214 Q. That pressure of one hundred pounds carried at the city is carried at the end of the main line—at the city limits?

A. Yes.

215 Q. It is not in the distributing pipes?

A. No; it is at the regulator outside of the city.

216 Q. And, in order to maintain the pressure there, what pressure is it necessary to maintain in the field?

A. That is altogether owing to your consumption. If your consumption is very large it will take the whole rock pressure.

217 Q. What is the average pressure maintained ordinarily through the day to maintain one hundred pounds pressure here?

A. In the field?

218 Q. Yes.

A. Well, we generally carry 290 to 300.

219 Q. And, with the ordinary daily consumption, that gives you a pressure of one hundred at the city limits?

A. Yes, sir.

220 Q. And that is about the pressure, is it not, at which the gas is supplied to the distributing pipes through the city?

A. They intend to carry about one hundred pounds or ought to carry about one hundred pounds to give everybody plenty. The pressure is reduced to six-tenths within the high-pressure regulator put in out there, and then the gas passes through that until it gets down to twenty pounds; that is the state of the high before it goes to the low; that is my idea—from twenty to thirty pounds.

221 Q. Then you say it is, from the high-pressure lines, reduced to what?

A. Six-tenths; mercury pressure is about that pressure; that is about the average pressure through the country in low-pressure lines. Our people may carry more or may carry less; I am not sure.

222 Q. That is according to consumption?

A. No. You can't have your pressure in the main line up and down; it hadn't ought to. If your regulators are worked properly they will maintain that pressure all the time, because as the consumption increases it will open up.

223 Q. The statements which you have given are based upon the knowledge which you have of the Northwestern line, so called, are they not?

A. Yes.

224 Q. And do not refer, as I understand you, to the Toledo line?

A. Not so much to the Toledo line.

225 Q. The Northwestern line is a ten-inch line?

A. Yes, sir.

226 Q. Its entire length to the south limits?

386 A. No. We have two eight-inch lines running from the ten, outside here a mile or so, that connects in with the ten-inch; there are two eights. We didn't run the ten-inch pipe up to the city limits; the ten-inch was stopped back at the Oregon road, and the two eight-inch lines run back and connect with the ten-inch.

227 Q. How far is the Oregon road from the city limits?

A. I don't know. I am not sure that it is the Oregon road. I have heard them talk about the "Oregon road." I know that it is outside here. I was here one night when they were putting in the lines. I know it started out of town, near the woods, with the eight-inch lines.

228 Q. How near does the ten-inch line come to Toledo before it divides into the two eights?

A. I think within a mile of town. I am not sure. The two eight-inch lines run about a mile from the house over there before they connect with the ten. The two eights would be a little bit more than the ten; not much.

229 Q. The capacity of pipes varies as the square of their diameter, does it not?

A. Yes, sir.

230 Q. To what extent did the Northwestern line develop leaks during the past winter?

A. There was quite a number of leaks.

231 Q. To what extent did it become necessary to repair the line during the last year?

A. We have been repairing all the time and trying to stop those leaks.

232 Q. Is it not true that that line is so constructed that it leaks at almost every joint?

A. No.

233 Q. Does it not leak at a large number of joints in every mile?

A. Quite a number to the mile—that is, it did before these repairs. We have been repairing the line for the past year, off and on, just as we have had time and materials to repair with.

234 Q. Do you know how the field pressure and the city pressure

on the Toledo line compare with the city pressure and the field pressure on the Northwestern line?

A. I think about the same.

235 Q. Was it necessary to maintain the same pressure on the Toledo line, in order to get one hundred pounds to the city, as it was on the Northwestern line?

A. Yes, sir; about the same. Our lines didn't leak so bad—it made some difference. Our line is constructed in such a manner that the higher the pressure the tighter the line—the Northwestern line.

236 Q. That was supposed to be so?

A. It was so.

237 Q. Hadn't you a great many breaks in the Northwestern line?

A. With the couplings we had made in this town—made of pot-metal—they blowed up. We never had more than one or two couplings break which were made outside of the city—very few breaks. It was on account of the way that the couplings were constructed.

238 Q. Is it not true that you have had occasional breaks in the Northwestern line, such as necessitated the shutting off of the supply of gas in that line entirely from the city?

A. Occasionally that has happened. I think probably no more than three or four times.

387 239 Q. Three or four times—in the winter season I speak of particularly?

A. Yes; I think we had a couple of breaks last winter and a couple of breaks the winter before.

240 Q. At those times the supply of gas from the Northwestern was entirely cut off from the city of Toledo?

A. That is true—that line.

241 Q. How was the city supplied during that time?

A. Through the Toledo line.

242 Q. For what length of time did these interruptions continue?

A. Our break wouldn't take over two hours to repair, unless it was at great distance from the point where we kept the supplies, and I think we had only one break any distance away, so but what we could reach there and get it repaired.

243 Q. Do you know how many days last winter the supply of the Northwestern Company to Toledo was cut off?

A. How many days?

244 Q. Not a day, to my knowledge, not an entire day—not a half a day.

245 Q. And the year before, how was it?

A. They did not the year before.

246 Q. Do you mean to say that there has not been an entire day at any one time?

A. No, sir; there has not been an entire day when the gas was out of that line, unless it was some summer Sunday here this last summer, when they took the gas out of the pipes to repair and put

on sleeves and broke off these Milmine couplings and put on sleeves.

247 Q. I speak of the winter time.

A. There has been no one day when the gas has been shut off that line twenty-four hours or even twelve hours. I don't think it has been shut for six hours. I suppose that it might have shut off six hours at one time, but I hardly think it is possible. I think I am within bounds when I say that.

248 Q. What is the size of the Toledo Company's lines?

A. It is a ten-inch line. I don't know just exactly. I know what it is at the lower end. If I say anything about it it will be hearsay with me. There is a part of it that I understand is a twelve-inch line. I don't think there is many miles, but I think I have heard them say either eight or twelve miles. Twelve miles, I think, is twelve inches.

249 Q. And since the consolidation of the Toledo and Northwestern companies, or rather since the business of both companies has been under one management, have you been in charge of the field for both companies?

A. I never have paid much attention to the other company's business. There are three men down there that go right along with that business. If there is anything comes up I am supposed to go and look after it.

250 Q. Do you know the capacity of that line?

A. No.

251 Q. Do you know how much it furnishes to the city of Toledo?

A. No, sir; I do not. All I know about the Toledo line is what Mr. Lambing has told me, but I don't suppose that would be any evidence at all.

252 Q. What I want to get at is, the proportion of Toledo that the Toledo line furnishes.

A. I claimed that we furnished the city twenty million; Mr. Lambing claimed that they done the same, and that we was
388 only furnishing about fifteen. I doubt very much whether that line furnished Toledo as much gas as we did.

253 Q. Then from the information in your possession you claimed that the two companies furnished to Toledo about thirty-five millions daily?

A. Something like that; yes, sir.

254 Q. And Mr. Lambing claimed about forty?

A. No, that is wrong. Mr. Lambing claimed twenty and I claimed twenty, and I think that Mr. Lambing was mistaken. I don't think there was as much gas passed through their line as through ours.

255 Q. You claimed that the Northwestern was furnishing twenty millions daily?

A. Yes, sir.

256 Q. Which you make the aggregate forty millions daily?

A. Yes.

257 Q. But you claimed that the Toledo Company was only furnishing fifteen millions.

A. Yes; something like that; and it is possible that we didn't furnish over fifteen, but I calculated. I thought it was about thirty millions consumed.

258 Q. There was, then, furnished to the city of Toledo between thirty and forty millions cubic feet daily?

A. Yes, sir; and no one knew—it may not be accurately correct.

259 Q. There is a large margin between thirty and forty million feet daily.

A. Yes; I know there is.

260 Q. What would you say was the outside figure?

A. I think that would be the outside figure. If you want me to tell you——

261 Q. Tell us all you know.

A. I judge the consumption from the amount of the supply in the coldest weather.

262 Q. What is the amount of supply in the coldest weather?

A. I don't think it is possible for us to deliver in Toledo more than one-fourth to one-fifth of what we have got in the field.

263 Q. What was the supply in the field, if that is the way you get at it?

A. I approximated the field supply.

264 Q. At what figure?

A. That would be, say, one hundred and sixty millions.

265 Q. For the two companies?

A. Yes, sir. When the weather is very cold they holler all the time for more gas. If you are in the field and have charge of the wells you begin to know something about the amount of gas which it takes to supply a city of this size, if you are crowding everything you have got into the line and still they are hollering for more. There are some things that astonished me in the Northern Ohio gas field, and that is the pressure and the way it goes off in the isolated wells—wells not coming into town here. Down here on a piece of land south of Van Buren they have got a well opened there; it has been opened; it has been wasting the gas from the well a long time. That well has made a difference in the gas pressure, I think. I can't see anything else that has done it, only that well. You see the hole has been open there and the gas coming out; it just seems as though that was taking gas out of that rock, so that it is perceived in wells quite a little distance.

266 Q. When was the work of constructing the Northwest-
389 ern line commenced, do you remember?

A. Yes; I think it was three years ago come February.

267 Q. When was it completed?

A. It will be three years next July.

268 Q. It was completed inside of six months, was it not?

A. Oh, no, sir; it was not. That work was commenced, I think it was about the first of February—I am not sure as to just exactly the date—and we didn't get the gas here until along in July; I think probably it was past the middle.

269 Q. That is about six months?

A. Yes; about six months.

270 Q. Do you know the length of time that the Toledo line was in the process of construction?

A. I don't; but we commenced to ditch long before we commenced to lay the line. You can't say it was done just exactly within six months. We commenced ditching in the middle of the winter.

271 Q. It was all constructed within a year, wasn't it?

A. Yes, sir.

272 Q. To what territory was that Northwestern line connected when it was finished—that is, what field did you pipe to?

A. We piped it to the south part of Bloom township.

273 Q. Do you remember how many wells there were in the south part of Bloom township when you commenced the construction of the line?

A. I don't remember how many wells we had in there then.

274 Q. Approximately?

A. Of course, we laid other lines to this line, and there was probably fifteen or twenty wells drilled in there; I would say fifteen wells.

275 Q. In the south part of Bloom township when yon began to construct the Northwestern line?

A. Yes, and over in Hancock; there were fifteen or twenty wells along that line when it was first constructed, and then we drilled other wells right along.

276 Q. Does that fifteen or twenty include all of the wells around there, or only your wells?

A. Those were our wells. I should say probably there were about seventeen wells when we had that line completed—when we got through with it; I think we had about seventeen wells.

277 Q. Do you know how many wells you had there when you began the work of constructing your lines?

A. I don't know. I know we were drilling right along. I don't know how many we had completed when we commenced the line.

278 Q. You had several rigs running and drilling all the time when you were engaged in constructing the Northwestern line?

A. Yes, sir.

279 Q. You had perhaps four or five wells when you commenced the line?

A. We had that; more than that.

280 Q. Were these wells connected with any other line?

A. No, sir. This was our first line in that section.

281 Q. About how long does it take to drill a well in that territory?

A. Oh, if they have good luck from the time they get their stuff on the ground they can get it away in two weeks—fourteen or fifteen days.

282 Q. At what depth do you strike the Trenton rock in that field?

A. In the south of Bloom about ten ninety (1,090) to eleven hundred (1,100). The Trenton is all over the section about that.

390 283 Q. At what depth do you strike the Trenton at the Stewartsville field, in Hancock county?

A. I think about 1,140 to 1,158; along there.

284 Q. Which were the heavier wells—the Stewartsville wells or the Bloom township wells?

A. I don't think the Stewartsville wells are any better than the Bloom township wells; there are so many misses in the Stewartsville. There is a difference in the wells for the reason that the wells in the south end of Bloom are more uniform. In the Stewartsville they will get a little bit of a stinker alongside of a great big well—eight to ten or twelve millions—and the next one, close by, will be about two.

285 Q. How many wells are there in the Stewartsville less than three millions?

A. If they hadn't shot them—those wells that they drilled there—there would be just about one well in seven that would be better than three millions.

286 Q. How many of the three wells on the Skinner tract, if you know, have they shot?

A. I ain't omnipresent, you know. I know they shot two of them. I heard the report of one, and I was present when they were putting in the other one.

287 Q. How many wells on the Ware tract were shot?

A. I don't think any of those were shot; I don't think so.

288 Q. And the Dewey Stave Company well—was that shot?

A. No; that wasn't shot. There is a little strip of territory through there very prolific.

289 Q. What is the depth at which you strike the Trenton in the prolific territory as compared with that in Bloom township?

A. You strike it deeper.

290 Q. Then the larger wells are found lower down on the dip?

A. It seems to be so in some cases, but not in all cases.

291 Q. Do you get salt water in the shale there?

A. No, sir—that is, I don't know of any salt water being found down there; not any at all.

292 Q. Is it not true that the shale is always dry?

A. It is supposed to be dry always.

293 Q. And where the water comes in it comes in from above, don't it?

A. Salt water?

294 Q. Where the water comes into the shale from drilling it comes in from above?

A. Yes, sir.

295 Q. And it is fresh?

A. Yes; you shut off the surface water.

296 Q. You always case down to the shale and from there down until you strike water. You never encounter any water in the shale?

A. No, sir.

297 Q. The shale is dry, uniformly?

A. Yes; as a general thing. There are wells down around Pittsburgh that they claim to get water in the shale rock after they had cased off the surface and gone away down quite a depth below, but

not, I think, in the gas or oil region, but outside of Pittsburgh there, where they get neither gas nor oil.

298 Q. Have you ever found water in the shale in Northwestern Ohio?

A. No, sir.

299 Q. What is the fact about finding salt water in the gas field in Northwestern Ohio? Is it uniformly found?

A. It is the exception to find salt water.

391 300 Q. Is it true that salt water follows the exhaustion of the gas, as a rule?

A. I think probably that that is correct—salt water or oil; more oil generally than salt water.

301 Q. What is your theory as to the pressure that the gas has when it is struck? How does that arise?

A. It is that rock pressure. How does it get there?

302 Q. Yes; why is there a pressure there?

A. I don't know; you must ask Prof. Orton about that.

303 Q. Do you know the depth at which the rock was struck in the Mellott well?

A. Yes, sir.

304 Q. What was it?

A. 1,138.

305 Q. That is the largest known well in the Findlay field, is it not?

A. Yes.

306 Q. One in Northwestern Ohio?

A. Yes, sir; that showed the greatest pressure. I have had a gauge on almost all the wells, excepting the great, big Karg well, and this well showed fifteen more pounds pressure open flow than any well I ever gauged.

307 Q. It is true that that well has the largest capacity of any known well in Northwestern Ohio?

A. I think so; yes, if there is anything in figuring the amount of gas coming out of a five and five-eighths hole; if they can come at it in any way she is the largest well that has been found.

308 Q. What was the open pressure in that casing?

A. Twenty-six pounds. She had been closed and I supposed I was going to get 450 pounds and I got, by actual measurement, 378. Then I went over to the other well, that I didn't know who owned and didn't care who owned, and got the rock pressure in that well, which showed 373 pounds; that is a well drilled just south.

309 Q. The tube works well?

A. Yes, sir.

310 Q. What is the capacity of that well?

A. I don't know.

311 Q. What does your experience show as to the theory of there being an ocean or sea of salt water following any of these wells and flooding them out one after the other?

A. All I can say to you about that is the mill I have been through in Pennsylvania. Whenever the wells would get down small—a cluster of wells like the Zarbaugh tract—they would begin to

weaken. I am speaking of oil wells. They began to weaken and get down small, and finally they would commence to come up, and a two-barrel well would pump from ten to twenty barrels a day, and in a week's time they would be entirely dried up and the water take the place of the oil.

312 Q. That was different rock from the gas rock?

A. It is pretty near the same thing; it is a pebble rock and so is this, to a certain extent. This rock seems to have been all melted some day and run together, but if you examine it closely you can see there are pebbles in it.

313 Q. At what depth was the rock in Pennsylvania to which you refer?

A. Those wells were about thirteen hundred; they were oil wells.

314 Q. About this theory of the salt water following up and
392 drowning out wells in Northwestern Ohio, what has your observation shown you about that?

A. I have not seen any of it yet, excepting that the wells are not as dry as they were two years ago—some of them—and some of them are just as dry.

315 Q. Isn't it true that a large number of holes have been drilled and abandoned and the wells left in bad condition, and the salt water comes down?

A. In some cases, but late years there has been lots of laws passed by the Legislature to make every man plug his well.

316 Q. Don't you know that the law has not been complied with?

A. I don't think it is, entirely, but we have not opened wells in our section of the country that I know anything about, unless they are in the oil region.

317 Q. How about the Findlay field?

A. That I don't know anything about. Certainly, if a well plays out it ought to be plugged.

318 Q. I want to ask you if, in your experience, you have known of wells in this field having been exhausted or turned to oil and then wells drilled close to them that would produce gas.

A. After they had showed signs of oil and another well drilled near by?

319 Q. Yes.

A. No; I have not had that kind of an experience, but I have had the experience of having a little oil in some of the gas wells. It has been coming within the last six months.

320 Q. Where a well goes dry would it happen that you could drill another well close by it and get a good gas well?

A. That I couldn't answer, because we have had none go dry, but I think it is a sponge, and if you put a hole in it it is exhausted just that much, and you can't get the same pressure or as much gas at the second well as you did out of the first. I think any one will bear me out in that—that the older the territory is the less gas there is in it, and the pressure shows that. It is going off. The pressure on the Kagy was a year ago 410, and you can't get but 360 out of it to-day.

321 Q. The production of the field is constantly increasing, is it not—the gross production?

A. By drilling?

322 Q. Yes.

A. I don't hardly think it is.

323 Q. That is true of the Western Pennsylvania field, is it not?

A. That is a different field entirely from Northern Ohio. We get a big well and it will show—in Pennsylvania, a thousand pounds pressure and you drill another well along side of that and you couldn't get three hundred pounds pressure. The pressure in the rock is not all alike; is far different from Ohio.

324 Q. It is true that the production of the Western Pennsylvania field is larger than at any other previous time in its history?

A. No; I think not. I am pretty sure that the factories are almost all shut off, and they are only using gas now for private consumption. That is my information, not from people interested in gas, but from friends that I have in that country in three different places.

325 Q. You have no personal knowledge of it?

A. I have not been there to see, but I have brothers and sisters living there.

393 Re-examination:

1 Q. When was the Stewartsville field first brought in?

A. When the Mellot was first found.

2 Q. What time was that?

A. I think it was in March—last spring some time.

3 Q. How long has there been drainage from that field?

A. There has been no particular drainage from it. Of course, the people of Findlay have got a line in there, and they have got to going out of there.

4 Q. In your direct examination, if I recollect right, you said that under continual drainage any territory would in time become exhausted, you thought.

A. Yes, sir.

5 Q. Has there been yet sufficient drainage of the Stewartsville field, in your estimation, to have any perceptible effect?

A. No, sir; I don't think there has been gas enough taken out of there to affect the wells that are drilled in there; not yet. That well that I spoke of that is open there—I spoke of that on account of our pressure running down so immediately around there. I didn't know but that that was the main cause of it, because we hadn't our wells open and wasn't using gas. It was not going into the line, and I couldn't see what was carrying that pressure off.

394 Also HAMILTON S. CORWIN, being recalled for further cross-examination and previously sworn herein, further testified as follows:

Mr. BROWN:

1 Q. I will ask you if you have examined your books and reports for the purpose of testifying with certainty as to those subjects about

which you said the other day it would be necessary to examine your books.

A. No, sir.

2 Q. And for what reason?

A. The books are not mine.

3 Q. Are they accessible to you as auditor?

A. They are.

4 Q. Have you made the attempt to make the examination?

A. No, sir.

5 Q. Have you consulted with your superiors in regard to the matter?

A. Yes, sir.

6 Q. What are your instructions in regard to furnishing the facts?

A. My instructions are not to give any information from the books of our company.

7 Q. Are you able to state at this time the number of wells connected with the Toledo lines at the present time?

A. No, sir.

8 Q. Are you able to state the number of wells connected with the Northwestern line at the time your company commenced furnishing gas to the city of Toledo?

A. No, sir.

9 Q. Are you able to state the number of miles of pipe which the Northwestern Company had in Toledo when it commenced to furnish gas?

A. No, sir.

10 Q. You were instructed to furnish no such information, were you?

A. I was instructed not to furnish any information from the books of this company.

11 Q. You have furnished some information in this case at your first appearance as a witness. Did you consult your superiors as to furnishing them?

A. No, sir.

12 Q. The information there furnished was from the books of your company, was it not?

A. If I gave any information that came from the books of the company it was taken from them.

13 Q. Why should you furnish it upon the application of the complainants and refuse to furnish it upon the application of the defendants?

A. I had had no instructions previously.

14 Q. Why did you not get instructions before testifying?

A. I didn't give it any thought.

15 Q. Were you requested by Messrs. Doyle & Scott, the general counsel of your company, to furnish that testimony?

A. I was requested to testify.

16 Q. By whom?

A. By our attorneys, I think.

17 Q. And you furnished such information as they wanted without consultation with your superiors?

A. I furnished such information as they wanted without consultation with any one else, as I remember.

18 Q. Why did you do that?

A. As stated, I was asked to appear and testify, and I did so.

395 19 Q. Where did you get the information which you furnished before?

A. Principally from—what information do you refer to?

20 Q. All the information.

A. That question is not definite.

21 Q. You furnished some information in your former testimony, given as a witness for the complainants, did you not?

A. I have testified previously.

22 Q. Do you mean to say that you could remember the exact lengths and sizes of all the pipes in the city of Toledo without reference to your books?

A. I have not said that.

23 Q. You furnished that information, didn't you?

A. What information?

24 Q. In reference to the lengths of the pipes.

A. I have furnished some information in regard to that.

25 Q. Did you go to your books for that?

A. I have got the most of that in the statements prepared for the tax returns.

26 Q. Did you get that from statements on file in the public offices or from the books?

A. I got it from my copies of the statements themselves that I made.

27 Q. Did you furnish any information not contained in those statements relating to the sizes of pipes, &c.?

A. Yes, sir; there have been some additions made.

28 Q. Where did you get that?

A. That came from information that I had on hand in my office.

29 Q. From the papers and books of the company?

A. From the papers and books of the company, I presume.

30 Q. Will you state the number of fires that are supplied by the Northwestern and the Toledo companies at the present time?

A. I do not know.

31 Q. This, I believe you have said, was a part of the information obtainable from your books, did you not?

A. Yes, sir.

32 Q. And that is a part of the information which you are not permitted to give?

A. Yes, sir.

33 Q. Can you tell the number of consumers supplied by the Toledo and the Northwestern gas companies, in Toledo, at the present time?

A. No.

34 Q. Can you give it approximately?

A. What do you mean by approximately?

35 Q. Within a hundred.
A. No, sir.
36 Q. Or within five hundred?
A. No, sir.
37 Q. Or within a thousand?
A. No, sir.
38 Q. Have you a thousand consumers?
A. I presume we have.
39 Q. Have you two thousand?
A. I don't know how many we have.
40 Q. Have you two thousand?
A. I think we have.
41 Q. Have you three thousand?
A. I must decline to answer the question.
42 Q. Why?
A. Any information of that kind would have to be derived from the books of the company, and I am prohibited from giving you any such information.
43 Q. Have you not said that you didn't give any information from the books of the companies in response to these inquiries?
A. No, sir; I think not.
44 Q. Didn't you say, in the beginning of this testimony,
396 that you hadn't examined the books for the purpose of furnishing this information?
A. Yes, sir. You asked me when you first begun to-day, one of the first questions you asked me in reference to certain questions that you had previously asked me, whether I had examined the books for the information which you had previously asked me for, and I told you "no."
45 Q. Do you mean to say, then, that after your connection with the Northwestern Ohio Natural Gas Company, for nearly three years, in the city of Toledo you don't know within a thousand of the number of consumers that company has at the present time?
A. I don't think I could tell within a thousand.
46 Q. And that you couldn't tell within a thousand of the number of consumers that the Toledo Company has at the present time?
A. I don't think I could, positively.
47 Q. Within a thousand either one way or the other?
A. I decline to answer any further questions on that subject. By "that subject" I mean I decline to give any information coming from the books of our company.
48 Q. Have you no knowledge of the number of consumers which the Northwestern Ohio Natural Gas Company has, except as you get it from the books of the company?
A. No, sir.
49 Q. Are not you personally acquainted with the number of consumers of the company?
A. I couldn't state it. I have a personal acquaintance with a large number of consumers.

50 Q. Haven't you information as to the number, approximately, outside of the books of the company?

A. If I had that information I would refuse to give it.

51 Q. Have you it?

A. If I had that information I would refuse to give it.

52 Q. Have you that and refuse to give it?

A. I refuse to give any information coming from the books of the company.

53 Q. Do you refuse to give me any information in your possession that does not come from the books of the company?

A. Any infornation of that kind would have to come from the books of the company.

54 Q. Do you refuse to give any information which — possess which does not come from the books of the company?

A. Any information on that question would have to come from the books of the company, and I refuse to give it.

55 Q. Have you information concerning the number of consumers excepting what you get from the books of the company?

A. I have no other information.

56 Q. Do you mean to testify here now, upon your oath, that you know nothing about the consumers of the Northwestern Ohio Natural Gas Company excepting the information that you get from the books?

A. How could I?

57 Q. I simply want to know if you make oath to that fact?

(Not answered.)

Mr. SCOTT (to the witness): If you have any knowledge that you can give approximately the number of consumers upon either of the lines, I am almost satisfied that there is no objection to giving it.

397 WITNESS: I could not tell how many consumers the companies had excepting I got the information from the books. I could not give any definite information regarding the number of consumers that the companies have excepting I got the information from the books of the company.

Mr. BROWN:

58 Q. I don't ask you for definite information concerning the exact number of consumers. The question which I am now asking you is whether you are willing to make oath that you have no information concerning the number of consumers which the Northwestern Ohio Natural Gas Company has, excepting such information as you derive from the books?

A. All such information would have to be obtained from the books.

59 Q. Did you not personally make a large number of the contracts with the consumers?

A. Yes, sir.

60 Q. Were not your duties as superintendent for the past three

years in connection with the consumers of the Northwestern Ohio Natural Gas Company?

A. Yes, sir.

61 Q. Do you not know the rates at which gas is supplied to a large number of consumers?

A. I do.

62 Q. Have you any personal knowledge of that outside of the books?

A. Yes.

63 Q. Are not the records and books made up from the contracts consummated by you as superintendent?

A. Not all of them.

64 Q. Are not the books made up largely from information obtained from you?

A. Yes, sir.

65 Q. Were you not the chief representative of the Northwestern Ohio Natural Gas Company in the city of Toledo for the last three years, during which time all of your contracts have been made?

A. Yes, sir.

66 Q. Are you not personally acquainted with a large number of the consumers of the Northwestern Ohio Natural Gas Company who have been consumers for two or three years past?

A. I have been with consumers since we commenced serving them; yes, sir.

67 Q. Do you now mean to say that you have no information as to those consumers or the number of contracts or the prices paid on those contracts or the terms of the contracts, excepting such as you got from the books?

A. I have not so testified.

68 Q. Do you then refuse to give the information which you have and which you have obtained outside of the books?

Mr. SCOTT (to witness): Anything which you can testify to from your knowledge you may tell. If you can tell how many consumers the Northwestern Company has you may tell it, so far as I have any advice to give.

(WITNESS:)

A. I can't tell.

Mr. SCOTT: Give it as near as you can. There is no objection to that, I know.

WITNESS: Any information I would give I would be at
398 sea, because I don't know. I am willing to give what information I can, but I told you I didn't know those things.

Mr. BROWN:

69 Q. The question is whether you refuse to give the information in your possession which is not derived from the books?

A. No; I do not refuse to give information not derived from the books.

70 Q. Then state as nearly as you can the numbers of consumers

which the Northwestern Ohio Natural Gas Company has, so far as you know, without undertaking to disclose what the books show.

A. I might say that I think the Northwestern Company has between three and five thousand. It is over three. I don't think it is five.

71 Q. And does this include all classes of consumers, domestic and munufacturing?

A. That includes all classes of consumers.

72 Q. Have you any personal knowledge, outside of your books, of the number which the Toledo Company has?

A. Only from rumors and hearsay. I have not seen any statements of the number of fires they have, and was not personally acquainted with the administration of the company until a very recent date.

73 Q. You speak of the number of fires. Do you intend to distinguish between the number of fires and the number of consumers?

A. I understood the question to be "consumers," and I answered it with that understanding.

74 Q. Distinguishing between the number of fires and the number of consumers, do you know the number of consumers which the Toledo Company has, approximately?

A. The approximation would be as broad as the other, but I have understood that they had approximately the same number of consumers as the Northwestern.

75 Q. How is the city of Toledo supplied by the companies—divided relatively?

A. Substantially at Monroe street.

76 Q. What proportion of the portions of the city supplied is supplied by each company? Do they supply equal portions of the city?

A. That is my understanding.

77 Q. Do you decline to answer as to the gross income of the Toledo and of the Northwestern companies at the present time?

A. That information would have to be derived from the books of the company, and I decline to answer.

78 Q. That is one of the matters as to which you are not permitted to answer by your instructions, is it?

A. Yes, sir.

79 Q. You have said, I believe, that the information from which the statements and reports of the companies and of the officers and directors of the companies have been based were furnished largely by you, I believe, in your former examination?

A. I have furnished it largely from the books under my charge.

80 Q. Do you remember a statement of the earnings and expenses of the Northwestern Ohio Natural Gas Company, which was furnished for publication in the month of January, 1889, to show the earnings and expenses of the Northwestern Company for the period of fifteen months ending November 30, 1888?

A. I remember something about that.

81 Q. Is that one of the reports made up under your direction?

A. I assisted in the preparation of the report.

399 82 Q. I ask you to examine the newspaper copy of the report published in the Toledo Evening Bee of Tuesday, January 8, 1889, and ask you if you remember whether that is substantially the report as furnished for publication at that time?

A. That is undoubtedly the report that was furnished by the company.

83 Q. I will ask you to state, if you will, the gross earnings of the Northwestern Ohio Natural Gas Company from Toledo consumers for the period named in that report.

A. I should have to give that information by reading from this report. It is $194,008.51.

(By stipulation of counsel the report above referred to is hereto attached, marked Exhibit —, and made a part of the deposition of the witness.)

84 Q. How did the number of consumers compare at the date of that report with the number which the Northwestern Company now has?

A. There has been an increase.

85 Q. Of about what per cent., if you know?

A. I don't know.

86 Q. Had you at that time any connection with the Toledo Natural Gas Company in any way?

A. No, sir.

87 Q. You are not familiar with the report of that company published at that time, are you?

A. No, sir.

(The further taking of testimony herein was by consent of counsel adjourned to Tuesday, November 26th, 1889, at 2 p. m., to the city of Findlay, Hancock county, Ohio.)

400 FINDLAY, HANCOCK COUNTY, OHIO, *Nov.* 26, 1889.

The further taking of testimony herein was resumed at room No. 50, Joy House, at Findlay, Ohio, according to agreement, heretofore noted.

Present, representing complainants: E. D. Potter, Jr., Esq.
" " defendants: Guy W. Kinney, Esq.

ARCHIBALD MCDOUGAL, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. State your name, age, place of residence, and occupation.

A. Archibald McDougal; 38; occupation, drilling gas and oil wells; residence, North Baltimore, Ohio.

2 Q. How long have you been engaged in drilling gas and oil wells?

A. About twelve years.

3 Q. Whereabouts?

A. In Pennsylvania, New York State, and Ohio.

4 Q. How long have you been engaged in Ohio?

A. About four years.

5 Q. Whereabout in Ohio?

A. At Toledo, Napoleon, Defiance, and North Baltimore. I drilled one well down at Brookville, Indiana.

6 Q. What wells have you drilled at North Baltimore?

A. The city well No. 2.

7 Q. How many city wells are there there?

A. Two—there are three now. They have bought another recently.

8 Q. How recently?

A. I think it was about a month or six weeks ago.

9 Q. What, if anything, did you ever have to do with city well No. 1?

A. I cleaned it out. The packer or tubing bursted, and I had to go and clean it out and repack it.

10 Q. When was that?

A. A year ago, I think.

11 Q. When did you drill No. 2?

A. Two years ago.

12 Q. Do you know how long No. 1 had been in use then?

A. It had been in use a year then.

13 Q. That would be three years from now?

A. Yes, sir.

14 Q. Do you know what the capacity of those wells was?

A. As near as I could judge, about three million feet.

15 Q. At what time?

A. At the time they were drilled.

16 Q. What have those wells been used for?

A. For heating and lighting the city.

17 Q. Go on and state in your own way about how many fires there are there and what the gas is used for. Give us a general idea.

A. As near as I can tell, there are in the neighborhood of about seven or eight hundred stoves in town. There are three glass factories, the pressed brick works, and a pumping station and several boilers used for pumping oil wells, besides several other wells being hooked on the line for the purpose of drilling.

18 Q. How are the streets lighted there?

A. By stand-pipes and arches.

19 Q. With natural gas?

A. Yes, sir.

20 Q. How is the gas used there? Is it measured off by metre?

401 A. No, sir; I think not. I don't know as it is. I don't think it is with a metre; not to my knowledge.

21 Q. Do you live in North Baltimore?

A. Yes, sir.

22 Q. Are you burning gas in your house?

A. Yes, sir.

23 Q. How is it there?

A. There is no metre there.

24 Q. How are you using gas?
A. I use it at so much a month.
25 Q. Are you limited in the quantity that you can use?
A. No, sir.
26 Q. How do you pay for it?
A. By the month.
27 Q. At so much a stove, I suppose, or light, &c.?
A. Yes, sir.
28 Q. How many wells are supplying North Baltimore?
A. There have been two supplying it up to the last week; only two wells.
29 Q. And last week you put on the third well?
A. Yes, sir.
30 Q. How long has it been supplied by two wells?
A. About two years.
31 Q. And before that what was there?
A. One well.
32 Q. How long did that continue?
A. Two years.
33 Q. What, if anything, was the occasion of putting more wells on?
A. By putting on more fires and lights and attaching more onto the lines; boilers, and so forth—factories.
34 Q. I wish you would state, if you can, how the supply of these wells compares to what it was when the wells were opened, two and three years ago.
A. I don't think the supply has diminished any, from what I can see of these wells, from what they were when they were drilled in.
35 Q. Have there been any measurements made, to your personal knowledge, of any kind?
A. Not at all, that I know of.
36 Q. No indication of the pressure at any time?
A. Nothing more than to put on a gauge and let it run up and what rock pressure there was.
37 Q. What was it at the time it was opened and at the last time they were measured?
A. I have never seen them measured, but I know they ran up to about four hundred pounds pressure when they were first opened.
38 Q. Do you know when the gauge was put on the last time?
A. No, sir.
39 Q. So far as you know, judging from the consumption there, there has been no decrease in the supply at all?
A. No, sir.
40 Q. In your experience in drilling wells, how close together have you ever drilled wells or known them to be drilled?
A. I have known them to be drilled—gas wells—a couple of hundred feet.
41 Q. Supposing that a well is put down at a given point, and then afterwards another well is put down two hundred feet from that, more or less, what has been your experience as to the second well draining the supply of the first well?

A. I don't think it would.

42 Q. Have you ever known of a case where it did?

A. I have not.

43 Q. From your experience in the gas business, are you able to form an opinion as to the probable duration of the supply of gas in what is known as the Northwestern Ohio gas field, assuming that the drainage on the field remains about as it is now?

A. I don't think I could answer that.

402 44 Q. Are you able to form an opinion?

A. My opinion would be, judging from what I know of the gas fields in Ohio thus far, that it would last twenty or twenty-five years, anyway.

45 Q. How close together are these North Baltimore wells?

A. About from five to seven hundred feet apart.

46 Q. Are there any other wells in the immediate vicinity that have been drawn on?

A. No, sir.

47 Q. How far are they from the village of North Baltimore?

A. A little over half a mile.

48 Q. What would be your opinion as to whether or not the construction and operation of a natural-gas line would be an extraordinarily and extra hazardous business—financially, I mean, dangerous—assuming that you already have a good gas territory?

A. No, sir; I don't think it would.

Cross-examination by Mr. POTTER:

1 Q. In the branch of business that you are now engaged in are you operating for yourself?

A. No, sir; I am drilling for other parties. I am an operator and I am drilling for other parties.

2 Q. And your first service in the drilling of wells was where, and your experience?

A. In Pennsylvania.

3 Q. In what portion of Pennsylvania?

A. In the Bradford field.

4 Q. How long were you there?

A. In the neighborhood of six years.

5 Q. When did you go there?

A. I went there in 1876, I think it was.

6 Q. And was your service there in the drilling of wells while you were there?

A. Yes, sir.

7 Q. Gas wells and oil wells, both?

A. Principally oil wells; there are very few gas wells there.

8 Q. Were you a contractor there at Bradford?

A. Yes, sir.

9 Q. About how many gas wells did you drill in the Bradford territory?

A. One; I only drilled one gas well that I know of there.

10 Q. What well was that?

A. A well owned by parties in Bradford, out near—I couldn't tell their names, it was so long ago.

11 Q. How far from Bradford was it?

A. About five or six miles.

12 Q. Did you at the time of the drilling in of that well take any measurements of its capacity or its pressure?

A. No, sir; I did not.

13 Q. That is the only gas well you drilled in Pennsylvania?

A. Yes, sir; that is the only well.

14 Q. In the six years that you were in Pennsylvania were you doing this drilling in the neighborhood of Bradford?

A. Yes, sir; Bradford and Olean and Allentown, New York, and Bolivar.

15 Q. What use was this gas well put to?

A. It was a test well; we drilled it for oil and it proved to be a gas well.

16 Q. Was it abandoned?

A. Yes, sir; as far as I knew.

17 Q. As to what become of the well you know nothing?

A. No, sir; not after I left there.

403 18 Q. You made no measurements of it yourself?

A. No, sir.

19 Q. And you don't know anything about its capacity or how long it lasted or how long it continued to flow gas or what use or purpose it was put to?

A. No, sir; I do not.

20 Q. What was the next gas well that you bored and where? That is the only one you bored in Pennsylvania?

A. Yes, sir.

21 Q. Then you performed some service in New York?

A. Yes, sir; that was all oil wells; no gas wells there.

22 Q. So that prior to your coming to Ohio your experience, so far as the drilling of gas wells is concerned, was confined to this one gas well?

A. Yes, sir.

23 Q. Whilst at Brander and in the drilling of oil wells did you have occasion to examine or inquire or become informed as to the use of the natural gas that was found or produced from these gas wells in the vicinity of Bradford?

A. No, sir; I never have.

24 Q. Do you know anything about the capacity of the wells when first drilled in or their pressure or power?

A. No, sir.

25 Q. Your knowledge, experience, and observation is entirely, so far as your service in the Pennsylvania country is concerned, confined to Bradford and to this one well?

A. Yes, sir.

26 Q. You have never performed any services in the Pittsburgh gas territory district?

A. No, sir.

27 Q. You came to Ohio for the purpose of drilling wells about when?

A. About four years ago.

28 Q. Where was the first well you drilled?

A. At Toledo. We drilled for gas, but didn't get any.

29 Q. That was the well at the rolling mill?

A. No; at Air Line Junction.

30 Q. You didn't strike oil there?

A. No, sir; we didn't.

31 Q. The next well you drilled was where?

A. The next, I think, was at Weston.

32 Q. In Wood county, Ohio?

A. Yes, sir.

33 Q. Did you strike oil or gas there?

A. Very little of both.

34 Q. And that well was an unprofitable well?

A. Yes, sir.

35 Q. Then the next well succeeding that?

A. That was in Weston, in the same place.

36 Q. And with the same result?

A. Yes, sir.

37 Q. Did you drill any more wells in Weston after that?

A. That was all.

38 Q. Where was the next one?

A. After that I came to the North Baltimore field to drill oil wells.

39 Q. And the next well you drilled was at North Baltimore?

A. Yes, sir.

40 Q. When was that?

A. Two years ago this fall, I think.

41 Q. That was well No. 2?

A. Yes, sir.

42 Q. There had been three or four wells drilled near No. 1?

A. Yes, sir.

43 Q. The well that you constructed was called No. 2?

A. Yes, sir.

404 44 Q. That was drilled in about two years ago?

A. Yes, sir.

45 Q. At the time it was drilled in did you make or see made a test of its capacity or pressure?

A. No, sir.

46 Q. Did you ever know of or see a test made of its capacity?

A. No, sir.

47 Q. Did you ever see or know of a test being made of the capacity of well No. 1, so called?

A. Nothing, only I seen the gauge on it.

48 Q. When was that?

A. Before I drilled well No. 2.

49 Q. You saw the gauge on well No. 1, and that registered a pressure of four hundred pounds to the square inch?

A. I saw the gauge on the well, and that is what they said—told me.

50 Q. You didn't make any note yourself of it?
A. No, sir.
51 Q. So, then, as far as you know of the pressure on that well No. 1, it is not derived from any personal knowledge?
A. Only what I have seen on the gauge; I seen the gauge.
52 Q. You didn't see what it registered?
A. No, sir.
53 Q. You only know what it registered from what others told you?
A. Yes, sir.
54 Q. That is the only register you know of that well?
A. Yes, sir.
55 Q. As to No. 2 well?
A. I never saw any gauge on that well at all.
56 Q. How about No. 3?
A. That was drilled by other parties. I don't know anything about that at all.
57 Q. What other gas wells have you drilled in other than those which you have mentioned?
A. That is all the gas wells I have drilled in. I have drilled several places for gas, but never got it, though.
58 Q. They were non-producing wells?
A. Yes, sir. I beg your pardon. I did drill one more well, at Van Buren, since.
59 Q. Was that a productive well?
A. Yes, sir.
60 Q. Did you see any test made of the capacity of that well?
A. I did not.
61 Q. You know nothing of your own knowledge, then, as to its capacity or pressure?
A. No, sir; only that it made a very deafening noise. A man would think that it was a pretty big well if he stood close by it.
62 Q. The escape of gas from the pipe made a good deal of a roar?
A. Yes, sir.
63 Q. And that is the extent of your knowledge of its pressure?
A. Yes, sir.
64 Q. What is the population of North Baltimore?
A. I think it is in the neighborhood of fifteen or eighteen hundred. I don't know exactly.
65 Q. Are these wells owned by the corporation?
A. Yes, sir.
66 Q. They have three wells?
A. Yes, sir.
67 Q. Are they drawing from all three of them?
A. They are at present. They put the last one on about a week ago.
68 Q. Do you know what the extent of service of that first well was rendering before the attachment of the second well to the houses?
A. Oh, probably four or five hundred stoves.

69 Q. Besides other manufacturing industries—were they using it at that time?

A. As soon as they got located there. It supplied the town
405 for about a year, and then they put on glass factories and hitched them onto the No. 1 well.

70 Q. Since putting on the second well what is the service rendered?

A. Probably between seven and eight hundred stoves and the three glass factories and several boilers and the pumping station and the pressed-brick works.

71 Q. When was the third and last well attached?

A. A week ago.

72 Q. They are now drawing on three wells?

A. They just connected up the other wells in case they would fall short. I don't know that they are drawing on three wells.

73 Q. Do you know of your own knowledge or any experiments or observation that you have made that, as a matter of fact, the supply of the first or second well has been diminished or lessened since it was first drilled in, in its capacity or pressure?

A. Not on my own knowledge—only from hearsay. They tell me that it has not.

74 Q. What do you understand to be the extent of the gas territory in Northwestern Ohio, in square miles?

A. That I couldn't say.

75 Q. Could you define or locate the limits of it as you understand it—the boundaries of it?

A. I think Bowling Green on the north, Findlay on the south, Bloomdale on the east, and North Baltimore and Welker—along there—on the west, as far as I know it.

76 Q. You are, I suppose, acquainted with some of the existing gas wells in the same field, are you not? You have personal knowledge of some of the existing gas wells in the same territory, have you not?

A. In the territory that I speak of—that is, in North Baltimore and Van Buren.

77 Q. How many gas wells have they at Van Buren?

A. Well, I know of in the neighborhood, I guess, of twelve or fourteen.

78 Q. And you have personal knowledge of those wells, have you?

A. Of the ones in Van Buren.

79 Q. Have you inspected them and seen their operation?

A. I have seen that many.

80 Q. Can you form any approximate estimate of the daily production—the 24 hours production—or extent in feet to which gas is being supplied in this territory the boundaries of which you have stated?

A. No, sir; I could not.

81 Q. Can you give anywheres near any approximate estimate of the extent in cubic feet that the supply is being drawn on in that field the boundaries of which you have stated?

A. I don't think I could.

82 Q. What is the matter with the Karg well?

A. That I don't know.

83 Q. Did you ever inspect it or see it?

A. I never did.

84 Q. In your experience and observation have you had occasion to meet with what is called salt and oil in the wells which you were drilling for gas?

A. No, sir.

85 Q. So that, as far as your experience and observation goes, the effect of the occurrence of salt water and oil in these gas wells you know nothing about?

A. No, sir. What I have drilled have been perfectly clear of either salt water or oil—perfectly free from it.

406 86 Q. Your opinion is that if a well is put down in gas territory that produces a million or even two or three million cubic feet of gas per day that another well drilled, say, one hundred or two hundred feet from it and drawing on the same supply wouldn't reduce the pressure to any considerable extent or reduce the supply of the first well?

A. Not to any very great extent, I don't think, from my experience as I know it.

87 Q. So far as your actual experience goes, the wells at North Baltimore are seven or eight hundred feet apart?

A. Between five and eight hundred feet, I think. I never measured the distance.

88 Q. Have you any personal knowledge of the effect upon a well, say, with a capacity of supply of three million cubic feet of gas per day, where another well was drilled, say, within two hundred feet of it, drawing on the same supply—have you personal knowledge of the effect which the second well would have upon the first well?

A. Two hundred feet apart?

89 Q. Yes.

A. No, sir.

90 Q. You are unable to state what the supply per day was of the first well in North Baltimore?

A. No, sir; I can't state that.

91 Q. Nor of the second well?

A. No, sir.

92 Q. Nor of the third well?

A. No, sir.

93 Q. Are they using this natural gas for the lighting of North Baltimore?

A. Yes, sir.

94 Q. Exclusively?

A. Yes, sir.

95 Q. And with arches and flambeaux?

A. With arches and torch-lights—stand-pipes—at the corners?

96 Q. Are you able to give me what would be the cost at the well—we will say at North Baltimore—in the immediate locality of these wells, to the consumer of natural gas under this state of

affairs: two furnaces in the house, say, 26-inch fire-pots, six stoves, and a kitchen stove or range, what it would be per month or per year?

A. That I couldn't say.

97 Q. Could you approximate to it?

A. No, sir; for I don't know how much gas it would take to run the furnace.

98 Q. Do you know the sizes of mixers?

A. I guess they use mixers there.

99 Q. What is the size of the mixers you use?

A. I don't know.

100 Q. How many have you?

A. I have two—a heater and a cook stove.

101 Q. The gas is furnished through those mixers?

A. Yes, sir.

102 Q. The amount of consumption you can't give us any idea of?

A. No, sir; we sometimes burn more and sometimes less.

103 Q. What is the rate which you pay per month?

A. I think a dollar each month for a cooking stove and $1.37 for the heater for seven months. 104 *Q.* No, sir; I don't for I have no connection in the house for it; I use lamps.

105 Q. Is it generally used in North Baltimore as an illuminant in the houses?

A. I know of several houses there that use it as an illumi-
407 nant, but a good many others don't. There are not very many of the houses piped, I don't think, for burning it as an illuminant.

Re-examination:

1 Q. Can you give approximately about how many arches and torches there are used there for street-lighting?

A. There are two arches with five or six lights each in the arch, and I don't know how many torch-lights there are around through the town. I can't tell that exactly—in the neighborhood of twenty-five or thirty.

2 Q. How large are these pipes that are burning these lights in the streets?

A. I think the ones in the arches are one inch, and the others are three-eights to one-half an inch.

3 Q. How are they run—full open or closed in?

A. Yes, sir; they are full open. You would think so if you heard them roar.

4 Q. What sized glass factories are those which you have spoken of?

A. That I don't believe I could tell, because I have never made any inquiries.

5 Q. Do you know anything about the size of the pressed-brick factory?

A. That I don't know. It is quite a large institution for that kind, but I don't know how large it is.

6 Q. Do you know what the fact is about the gas territory having been extended recently, within the last two or three years?
A. No, sir; I have no knowledge of that.

Mr. POTTER:

1 Q. Your opinion as to the duration of gas wells and territory is based, as I understand, upon your knowledge and obervation as given here to-day?
A. Yes.

Also ABRAHAM HASBROOK, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. You may state your name, age, residence, and occupation.
A. Abraham Hasbrook; I am about 45; I live in North Baltimore; I am a blacksmith by trade.
2 Q. How long have you lived in North Baltimore?
A. I have lived there nearly nine years.
3 Q. What connection, if any, have you had with the natural-gas business in North Baltimore?
A. For the last two years I have been one of the gas trustees and a superintendent of the line.
4 Q. How long has North Baltimore had natural gas?
A. About three years.
5 Q. When it was first supplied with natural gas how many wells had it?
A. Only one.
6 Q. And that was drilled about three years ago?
A. Yes; it was three years ago this month (November) that we got it piped into town first.
7 Q. What did that well supply—how many houses or fires, factories, &c., with gas?
A. Well, there were in the neighborhood of between two and three hundred stoves on when we first took the plant.
8 Q. You first took the plant when?
A. The city first bought the plant and there was about that many stoves on.
408 9 Q. That was when?
A. Two years ago last June.
10 Q. What besides stoves were furnished with gas at the time you bought?
A. We run the grist-mill there, and I guess that that probably was all the machinery we were running at that time—an engine.
11 Q. How long was it before you had another well?
A. It was about a year before we got the other well.
12 Q. At that time, when the new well came in, about what was the first well supplying?
A. It was supplying all that we had. Of course, it was increasing in its population, but I don't think only the bottle-house was using gas.

13 Q. In addition to what you have already mentioned?
A. Yes.
14 Q. About how many stoves were used at that time?
A. In the neighborhood of about three hundred.
15 Q. From the time you first bought the plant up to the time that the second well came in, your number of stove consumers didn't increase any?
A. Oh, yes; it had increased some. At first it was between two and three hundred. It still kept on increasing. Our town was not building up so fast at first.
16 Q. What was the size of that bottle-house?
A. I think it was called a ten-pot house.
17 Q. What kinds of bottles did they manufacture?
A. I think about all kinds.
18 Q. Glass bottles?
A. Yes, sir.
19 Q. How many wells now are supplying North Baltimore?
A. Since last Sunday we have had on three.
20 Q. You have had all three wells turned on since last Sunday?
A. Yes, sir.
21 Q. What are you now supplying with gas?
A. We have got in the neighborhood of about seven hundred stoves, and we have three gas factories and the pressed-brick works and the grist-mill and the planing-mill and the pumping station, and then we have two or three or four boilers that are pumping oil and the dwellings. It is a pretty good sized town. I couldn't just say how many.
22 Q. Do you know what the sizes of the glass factories are?
A. The window-house is a ten-pot factory. I couldn't say what the flint-house is; I think about an eight or ten-pot house. Then there is a bottle-house, a ten-pot factory.
23 Q. What kind of a place is this pressed-brick works and the grist-mill?
A. I couldn't hardly tell you what the capacity of those is.
24 Q. You don't know what they are turning out?
A. No, sir. The grist-mill runs night and day the biggest part of the time.
25 Q. How many run of stone have they?
A. It is a roller mill. They have two burrs besides the roller process.
26 Q. How are your streets lighted?
A. With the torch-lights and arches.
28 Q. What is used in them for street-lighting?
A. Natural gas.
29 Q. How long have the streets been lighted with natural gas?
A. Nearly three years.
30 Q. Approximately, how many lights are there in the streets?
A. We have between thirty-five and forty torches besides the arches.
409 31 Q. How many arches?

A. There are four. They don't have them all lit—all at the same time; sometimes there is only two lit.

32 Q. Are the torches all lighted at the same time?

A. It is very seldom that they ain't lighted, and sometimes they burn them all day.

33 Q. How do you regulate the supply of gas in these torches and arches?

A. We open them up and let them "go Gallagher."

34 Q. How do you regulate the supply of gas in your houses and factories?

A. The factories have two regulators, high pressure and low pressure; and we have them turned on at the well pressure up to their factories, and then from there they regulate it themselves. Then the high-pressure regulator cuts it down to about twenty pounds, and then they have a low-pressure regulator that they use for their small work.

35 Q. You run the gas up to the factory at well pressure?

A. Yes, sir; the full pressure.

36 Q. That runs it up to their high-pressure regulator?

A. Yes, sir.

37 Q. Then they have got a low-pressure regulator, and they use the gas as they see fit—turn it on or off as they choose?

A. Yes, sir; just as they like it.

38 Q. How do you regulate the supply to the houses?

A. We have a high-pressure and a low-pressure regulator east of the town and we have one by the grist-mill.

39 Q. How do you regulate the amount of gas to be furnished to each house, if you do it at all?

A. They use all they like. We don't cut anybody short.

40 Q. If you know, I wish you would state what the capacity of well No. 1 was about the time it was first drilled in, or approximately, if you can.

A. I noticed the gauge that was on—that is, before the city bought it—that she would register 440 pounds when she was open or running and the town was using it.

41 Q. How about No. 2?

A. I couldn't say. We only just judged that it was about as good as No. 1. We have never had a gauge onto it.

42 Q. That measure that you have in No. 1 was taken about the time the town bought the plant?

A. Yes, sir.

43 Q. And that was a little over two years ago?

A. Yes, sir.

44 Q. Has there been any measurement taken, that you know of, since of that No. 1?

A. No, sir.

45 Q. At any place?

A. No, sir. We have never had a gauge big enough?

46 Q. I will ask you if there has ever been a measurement made of well # 1 since the time that the city bought it, at any place or at any time.

A. No, sir. They have a gauge at the factory, but I never saw it myself.

47 Q. Do you know of any measurement made of this well No. 1 by the factories or any one of them?

A. Only what they have told me.

48 Q. How recently was that?

A. Within the last two weeks.

49 Q. What factory was that?

A. The window house.

50 Q. How far is that from the well?

A. I would judge about three-quarters of a mile.

410 51 Q. What did they tell you was the measurement there at the factory?

(Objected to on the part of complainants as incompetent.)

A. They told me that when they wasn't making their melt that the pressure would run up to about three hundred pounds; it would run up to three hundred pounds.

52 Q. That, you say, is about three-quarters of a mile from the well?

A. Yes, sir.

53 Q. Judging from your knowledge of the management of the North Baltimore gas plant, what would you say as to whether or not either well No. 1 or well No. 2 had decreased in output or supply since the city first became possessed of it?

A. I don't think it has but very little, if any.

54 Q. What was the original cost of your plant?

A. We paid ten thousand dollars for the plant when we first bought it.

55 Q. And, approximately, what have you expended on it since in the way of extending your lines or new wells or any investment in the extension or improvement of the plant?

A. The first year, besides what we collected in as revenue, we spent about $2,000 drilling in the new well and putting in some new piping and extending our lines.

56 Q. And do you know about what your revenue was that year?

A. When we first bought it—that was in the summer season—that was about $250.00 a month.

57 Q. What would you say it averaged during the first year per month?

A. Well, during the winter months, the first winter, it was in the neighborhood of five hundred dollars per month—the first winter we owned the plant.

58 Q. For how many months during that winter was it five hundred dollars?

A. About six or seven months.

59 Q. For six or seven months, then, during the first year your revenue amounted to, approximately, five hundred dollars a month?

A. About that.

60 Q. And for the other five or six months it would average about how much, approximately?

A. About two hundred and fifty dollars.

61 Q. Now, since that, during the last year, what has been the revenue?

A. During the summer months it was about in the neighborhood of five hundred dollars.

62 Q. And during the winter months?

A. Last winter it run to about a thousand dollars a month during the winter to about five hundred dollars during the summer. After it got cold everybody hooked on their heaters. During the second year it run from a thousand dollars in the winter to five hundred in the summer.

63 Q. What is it now? You are on the third year, I understand you, now.

A. This month it would run about nine hundred dollars. We bought the plant two years ago last June.

64 Q. What has been your outlay during the second year and thus far into the third year?

A. Well, our outlay has been about all that we have been taking in as the revenue. We have been still extending our plant right along.

65 Q. Has it amounted to more than your income during the last year and this part of the third?

A. No; we have been keeping up.

411 66 Q. Have you got ahead any?

A. Well, I don't know how to answer that. We have got some money on hand and we have got some debts coming in.

67 Q. Is that for new supplies or for an old debt?

A. We have a bond coming due next month.

68 Q. And your total bonded indebtedness was how much?

A. Twelve thousand dollars.

69 Q. One of those bonds comes due within a short time?

A. The first of the month.

70 Q. State, if you know, whether you are going to be able to meet the bond from the proceeds of your business.

A. Well, I couldn't just exactly answer that question, I don't think, properly. We had been figuring that we could meet everything right up; but I have not attended two of the last meetings they had, and I don't know how the finances are.

71 Q. Aside from your expenses in extending or improving your line, what are your running expenses, approximately?

A. Well, I couldn't exactly state that; I have not figured onto it close enough.

Cross-examination by Mr. POTTER:

1 Q. How many trustees are there?

A. Five.

2 Q. You bought the first well two years ago last June?

A. Yes, sir.

3 Q. And you paid ten thousand dollars for the plant?

A. Yes, sir.

4 Q. The plant consisted of the first well and how many acres of territory?

A. We had twenty acres.

5 Q. Have you bought any territory since?

A. Yes, sir.

6 Q. How much?

A. We bought two eighties and we bought one forty, and we have a right of lease on two corners of a fifty. We have one well on our fifty-acre tract, but we have a right to only two wells on that fifty.

7 Q. What did you pay for the two eighties?

A. We pay three hundred dollars a year, well or no well.

8 Q. How many wells have you a right to drill on the eighties?

A. As many as we need.

9 Q. That is, three hundred dollars a year?

A. Yes, sir; that is for the first well. After that we have to pay two hundred dollars for each additional well.

10 Q. That is, on each of the eighties?

A. On the two eighties; yes, sir; they belong to two different parties.

11 Q. You pay three hundred dollars a year for one eighty?

A. Yes, sir.

12 Q. And three hundred dollars a year for the other eighty?

A. Yes, sir.

13 Q. With the right to drill as many wells as you see fit to bore, but for each well after the first well you pay two hundred dollars each additional?

A. Yes.

14 Q. And the other property that you bought is one fifty?

A. No; we bought the gas right upon a forty.

15 Q. What did you pay for that?

A. We paid fifteen hundred dollars for the gas right of that, and our # 3 well was on it.

412 16 Q. The gas right gives you a right to as many wells down as you please?

A. No; for that forty we have to pay three hundred dollars a well for the additional wells we put down.

17 Q. This gas right, as you say, is fifteen hundred dollars as your exclusive gas right?

A. Yes, sir; and one well.

18 Q. And for each additional well which you bore, in which gas is found, I suppose——

A. Yes.

19 Q. You pay three hundred dollars extra?

A. Yes, sir.

20 Q. How is it for the other pieces of property?

A. Two hundred dollars for each additional well.

21 Q. What did you pay for the first?

A. Three hundred dollars. On those eighties we haven't got any wells on them, and we are paying three hundred dollars a year, and we can drill a well and still pay three hundred dollars, and if we drill two we have to pay five hundred dollars.

22 Q. And if you drill another one you pay two hundred dollars?

A. Yes, sir.

23 Q. Does that comprise all your territory?

A. We have a right onto a fifty-acre tract to put down two wells. We have our # 2 on one corner, and we can drill another well on another corner.

24 Q. What do you pay for that?

A. We let a man have what gas he wants to use for burning brick or else one-fifth of the gas, but we never measured it to him, and he uses just what he wants.

25 Q. He gets his pay out of the gas he gets out of the well?

A. Yes, sir.

26 Q. Suppose you drill another well on the fifty, then what?

A. He just gets what he wants to use.

27 Q. Without further charge?

A. Yes; we can drill two wells on that fifty.

28 Q. You are paying out annually for gas rents and gas territory how much during this past year?

A. About all we have collected in.

29 Q. How much is that?

A. Probably about seven hundred and fifty dollars.

30 Q. For the year ending June, 1889, how much have you paid out for gas rentals and territory?

A. For the work on the line?

31 Q. No; just for gas. You have got one well of your own.

A. We have, and paid a royalty on that well of $200 a year.

32 Q. On the plant which you bought?

A. Yes, sir; the first one.

33 Q. Take it all in all, give us in round numbers the money that you pay out annually for royalty and gas rights and privileges that you are buying.

A. It kind of varies. I don't know just exactly how to answer that question.

34 Q. You know about how much it is.

A. It would be about four thousand dollars a year.

35 Q. This past year you have been paying out four thousand dollars for that?

A. In that neighborhood.

36 Q. How many employés does the city of North Baltimore require in the control, management, and conduct of the gas business, take it the last year?

413 A. A part of the time we only have about one or two men working, and in July, August, and September we have sometimes as high as six or eight of them working on the line.

37 Q. You have to have book-keepers and people to collect the gas tax?

A. Yes.

38 Q. Are the trustees allowed a liberal salary for their services?

A. Only for what they do.

39 Q. What do they pay the trustees there per year?

A. They don't get anything. They are a kind of a liberal set of fellows.

40 Q. What are your annual expenses—take it the past year? How much money in addition to the four thousand dollars that you paid for gas territory, privileges, &c., has been paid out in the last year for services in the conduct and management of the plant and business?

A. I couldn't tell.

41 Q. About how much?

A. I couldn't state it, anywheres near, because I have not paid any attention to that part of it myself.

42 Q. Your bonded debt is twelve thousand dollars?

A. Yes, sir.

43 Q. The interest payable when?

A. Semi-annually.

44 Q. At six per cent.?

A. I think it is six per cent.

45 Q. Your income for the first year was about how much, in round numbers—gross income?

A. It runs from two hundred and fifty to five hundred dollars a month.

46 Q. Take the first year that you were engaged in the business, what was the gross income, without deducting anything for expenses, cost, or outlay? What was your gross income for the first year, in round numbers?

A. I couldn't state that. I will tell you as near as I can (figuring). About four thousand dollars, as near as I can get at it.

47 Q. In round numbers, what was the expenditure for the first year?

A. I couldn't tell you that; I wasn't on the line all the time.

48 Q. I suppose you keep an account of the income and expenditures?

A. Our secretary keeps an account of everything paid out and what goes through the hands of the treasurer; but that is something I have not paid any attention to whatever.

49 Q. Hasn't there been any report made to you of the expenditures and income?

A. There was, last spring, at the election, but I couldn't say what they were.

50 Q. Were the expenditures more than the income or less than the income?

A. I think it was less—that is, that our expenditures, I think, was less than our income. We still keep increasing a little and getting a little better off.

51 Q. Take it this last year, what was the gross income, in round numbers, and what was the expenditure?

A. I couldn't give you that, I think.

52 Q. Whether your expenditures were more or less than the income in the past year?

A. It was about the same, I guess.

53 Q. How much matures of your bonded debt this fall?

A. Two thousand dollars.

54 Q. When does that mature?

A. About the first of next month.

55 Q. Do you know as a matter of fact whether you will be able to meet the bonded indebtedness then due from the income of the business?

A. I think so.

414 56 Q. Your bonds mature yearly after that?

A. Yes, sir; yearly.

57 Q. For six years?

A. Yes, sir.

58 Q. How near are these three wells together—to each other?

A. I would judge one was about five hundred feet, and #2 about five hundred feet from #1, and #3 is about twelve or thirteen hundred feet from #2.

59 Q. Are they in a line with each other?

A. They are near about in a line.

60 Q. And #1, is that the nearest to the city or the fartherest?

A. #1 and #2 are about the same distance. #3 is a little to the south and a little further away.

61 Q. Does #1 well lead directly to this mill?

A. No, sir; they are all connected together.

62 Q. From what well did this mill that you spoke of draw its supply?

A. We have only one main line running into the town.

63 Q. And all the wells are turned into the main line?

A. Yes, sir.

64 Q. In speaking of the pressure taken, as it was told you, within the past two weeks, that was the pressure upon the main line into which all three wells were directing their pressure or supply?

A. All three of them are now.

65 Q. How was it then?

A. There were only two wells at that time—#1 and #2.

66 Q. As I understand, the pressure, as you noticed the gauge on the first well, some two years or more ago—when did you notice that, just before the city bought it?

A. Yes, sir.

67 Q. And that registered four hundred and forty pounds to the square inch?

A. Yes, sir.

68 Q. Since that time there has been no measurement taken of the supply nor of the pressure, that you know of?

A. No, sir; not that I know of, at the wells.

Re-examination:

1 Q. What do you charge the factories?

A. Five dollars a year. We had to have something, and we made it as low as we could.

2 Q. Do you know what the population of North Baltimore was two years ago?

A. No: I couldn't state.

3 Q. Do you know what it is now?

A. I should say about twenty-five hundred.

4 Q. How much of an increase should you say that was in two years?

A. Well, nearly one-third, I should think.

Recross-examination:

1 Q. Practically the natural gas is being supplied to the industries, manufactories, &c., free?

A. To the manufactories.

2 Q. That is, to the industries and manufactories it is substantially free?

A. What has been coming since we got the gas.

3 Q. Do you know what proportion of the gas is consumed by these manufacturing enterprises?

A. No, sir.

4 Q. You keep no account of the supply, and of the pressure, and of the amount you consume, either for domestic uses or for manufacturing enterprises?

A. No, sir; we don't keep any account of it.

415 5 Q. What railroads have you in North Baltimore?

A. The B. & O., and we have a new one just started in there, which came in last Monday morning.

Also JAMES G. MILLS, of lawful age, being first duly sworn, testifies and deposes as follows:

Direct examination by Mr. KINNEY:

1 Q. You may state your name, age, residence, and occupation.

A. My name is James G. Mills; age, 57; residence, Findlay, and occupation for the last three years, dealing in real estate.

2 Q. How long have you been living in Findlay?

A. About thirty-five years; in Findlay not over five years, but near by for the past thirty-five years.

3 Q. What official position do you hold here?

A. I hold the position of gas trustee just at present, ever since last spring.

4 Q. I want to call your attention to a well that your town drilled in what is known as the Stewartsville field, near to a well that was subsequently drilled by what was known as the Farmers' Syndicate. I wish you would go on and state the history of those wells as you know it.

A. We drilled ours down. We both drilled at one time; was both drilled at one time. We got gas before they did.

5 Q. Where was this well located?

A. East from Stewartsville. I can't tell the exact distance, but we each of us had a town lot close to each other.

6 Q. How close?

A. I think about sixty feet. It may be nearer or further, but I would think about sixty feet.

7 Q. What was the depth of your well?

A. I couldn't tell that. It has been some time. I did know at the time, but it has been some time now since my attention was called to it, and I have forgotten; but it was over twelve hundred feet, I think. I am not positive, though.

8 Q. What sort of a well was it?

A. It was a very good gasser—I think about twelve million; perhaps a little over that.

9 Q. This Farmers' well was being drilled how far from your well?

A. I think about sixty feet; I think so. That is as near as I can recollect. It might have been a little nigher or a little further.

10 Q. Was the Farmers' well shot?

A. Yes, sir.

11 Q. I wish you would go on and state what you know about the shooting of that well and the controversy, if any, that led up to it and the actual shooting of it.

A. It increased the flow of their well considerably, and it didn't injure ours.

12 Q. What was the controversy that preceded the shooting of that well, if there was one, and the negotiations, whatever you have a mind to call them?

A. The negotiations—well, we didn't want them to shoot their well. That was the controversy. I stayed out there on purpose to see fair play while they shot their well and we opened our well up.

416 13 Q. What did they want you to do with their well?

A. They wanted us to buy it.

14 Q. Did they make any threats as to what they would do if you didn't buy it?

(Objected to on the part of complainants.)

A. I don't know as they did, particularly.

15 Q. Any statements as to what they would do?

(Objected to on the part of complainants.)

A. Their price was more than we wanted to pay, anyhow. I think I made an offer of three thousand dollars to them right then and there, before they shot the well. I was the only trustee there was out there at the time.

16 Q. Were you present when this Farmers' well was shot?

A. Yes, sir; I was.

17 Q. What did they shoot it with?

A. With dynamite or nitro-glycerine.

18 Q. Do you know how large the charge was?

A. I think it was one hundred quarts; I am not sure, though; perhaps one hundred and twenty. It was a big shot, it was a big shot.

19 Q. Before they shot the well was your well open or closed?

A. We had it closed, but we opened it—we opened it before, while they were putting their load down; they had it pretty much down before we opened ours up.

20 Q. Did the gas escape from your well; was that perceptible so you could see it?

A. Oh, there was some before we opened it up.

21 Q. Afterwards?

A. Oh, of course; it was easily seen and heard, too, for miles around.

22 Q. Now, you may state what, if any, effect the shooting of the Farmers' well with this glycerine has upon your well.

A. We couldn't notice any at all. We had it running out from this hole and we couldn't see any difference at all at that time. I had not made any inquiries for some time afterwards, and then the superintendent said it held its own.

(Objected to by complainants, as to what the superintendent said.)

23 Q. Did you notice the well afterwards?

A. I was there once afterwards.

24 Q. How long after?

A. I think a week or ten days—along there; it seemed to be as good as ever. I have not been about there since that time, that I recollect of now. I was past but not near by that well. I often inquire of them about it.

25 Q. Do you know what the capacity or measurement of either of these wells was, or which was the larger well?

A. I think ours was the large well. The city well was the largest; I am satisfied that it was, and it seemed to be clearer and bluer and nicer gas than the other, too.

26 Q. You don't know the actual measurement?

A. No; but I think twelve millions we calculated that well, and some over, I think.

Cross-examination by Mr. POTTER:

1 Q. When was your well drilled in—about how long ago?

A. I think it was in July. I am not positive, though, any more; maybe it was in June.

2 Q. Last June or July?

A. Yes, sir.

3 Q. Do you know, of your own knowledge, what amount
417 it registered—as to its capacity at the time it was drilled in or shortly afterwards?

A. No, sir; I don't. I couldn't tell you now. I have no doubt I knew at the time.

4 Q. What was done with the well after it was developed? Was it attached to the city line?

A. Yes; but it was some little time after that. We are using it now right along.

5 Q. How far from Findlay is it?

A. About five miles; it is about that.

6 Q. Have you any means of knowing, of your own knowledge, what the pressure is at the well now, or the supply in cubic feet?

A. No, sir; I couldn't tell you.

7 Q. You couldn't tell whether it has increased or diminished in supply?

A. No; not now; at the time it had no effect on it. Of course I made enquiries about these things, and that is all.

8 Q. What is the population of Findlay now?

A. We claim about twenty thousand.

9 Q. Can you give us any estimate of the cubic feet of consumption per day of gas here (Findlay)?

A. I don't believe I could.

10 Q. Can you tell somewhere near what it is?

A. I ought to, I acknowledge, but I have not given it my attention very closely.

11 Q. How many wells are you drawing on?

A. I think we have eleven wells out there. We are not using our town wells here, to amount to anything.

12 Q. What is the trouble?

A. We want to rest them.

13 Q. I suppose the supply has been exhausted.

A. It has been run down; yes; and we thought we would draw from out there and rest these. We have enough gas out there. We are drawing from eleven wells, but we have got some twenty-three wells out in that country.

14 Q. How does the capacity of the other wells compare with this one which you speak of?

A. They are smaller, with the exception of one.

15 Q. What is that?

A. We have a twelve-million well, I think, perhaps over that, on the Huntington—Huntington No. 2, I think.

16 Q. What is the capacity of those which you are drawing on?

A. They vary; we have them from a million and a half up to twelve million.

17 Q. What, in your judgment, is the daily supply of gas from those eleven wells which you are now drawing on?

A. I don't really know; I should think it would run from forty to fifty millions, anyway.

18 Q. You are drawing them from a distance of about five miles?

A. Yes, sir.

19 Q. Before that time you were drawing from what you call the city wells, located in the vicinity of Findlay?

A. Yes, sir.

20 Q. How many wells had you here from which you were drawing?

A. I think there were seventeen or eighteen; I am not sure. They were drilled, most of them, before I came in. I only came in last spring.

21 Q. How long had the city been drawing on that supply?

A. Upon some of them for the last four years.

22 Q. It was found, I understand, that the pressure and supply had, to a considerable extent, been reduced so as to justify the
418 drilling in of wells in some other localities.

A. Yes; of the securing of some more territory.

23 Q. How much gas territory has the city of Findlay?

A. We have about ten thousand acres; I guess above that—that is, outside of the corporate limits of Findlay.

24 Q. How much have you in the corporate limits?

A. I don't know; we haven't a great sight. We have not been allowing for that. We thought we had that protected. There is a good many would like to lease from us, but we haven't cared for that. We have been looking outside.

25 Q. Can you give us an approximate estimate of the grand total in acres that you have here?

A. I don't think I could. Yet we haven't got very much inside—that is, where we have leased we have but a few pieces inside. We have wells right around on lots in town here; some few pieces. I don't know of anything in well rights with the exception of the Ballard farm up here. We own that, but it is just well rights on lots. I think there are three lots, and on the Cary farm down there—I think there are three wells there.

26 Q. Before you drilled the Stewartsville well did you make a test of the city supply—that is, the extent to which the city supply was needed?

(Objected to on the part of defendants.)

A. Well, no, not particularly; at least I didn't. I suppose, perhaps, some of the rest of them did.

27 Q. Did the trustees who had the matter in charge make any investigation or examination as to the need of more or of the supply that then existed in the corporation?

(Objected to on the part of defendants.)

A. We were confident that our supply was exhausting, and that we would have to have some more. Our town was growing so fast that we needed a great deal.

28 Q. You found that the wells you were actually using—that the supply had decreased to some considerable extent?

(Objected to on the part of defendants.)

A. Of course. There are a number of those wells in town here, of course, not as good as they were when they had been running three years.

29 Q. Your observations here show that the continual drain on the wells for three years with a high pressure and big supply—that they depreciated in pressure?

(Objected to on the part of defendants.)

A. Yes, sir; I suppose about one-half in three years, and four; some of them ran four.

30 Q. Where is the Karg well?

(Objected to by defendants.)

A. In the northwestern part of town.

31 Q. About how far from the Joy House, the centre of your city?

(Objected to on the part of defendants.)

A. Not more than half a mile, or perhaps three-quarters.

32 Q. What was the capacity of that well when it was first drilled in?

(Objected to on the part of defendants.)

A. I don't know; I think it was calculated at about twenty millions. There was, of course, talk of a great deal larger than that.

33 Q. When was that drilled in?

(Objected to by defendants.)

A. Three years this winter, I think.

419 34 Q. Did the city draw on that?

(Objected to on the part of defendants.)

A. Yes, sir; they drew heavily on that.

35 Q. What is the matter with the Karg well?

(Objected to on the part of defendants.)

A. It has run down, of course; it has been overdrawn. We are resting it. I don't think we are using it at all. We ain't using any of the wells to amount to anything at all. There are some few houses, perhaps, attached to it.

36 Q. Did you find the Karg well diminishing in pressure so that it was impracticable to use it or to draw from it longer?

(Objected to on the part of defendants.)

A. We thought we could help it by resting it—was our main object.

37 Q. Was there any mingling of oil or salt water?

(Objected to the part of defendants.)

A. Yes, sir.

38 Q. Did it flow salt water or oil?

(Objected to on the part of defendants.)

A. I have understood—I wouldn't say positively that there was ever any salt water, but I know there has been a little bit of oil, but as to salt water I am not positive.

39 Q. Where a well blows salt water or oil what is that an indication of? The supply diminishing?

A. I should suppose so. That would be what I would think, anyway, in my judgment.

40 Q. And drawing down towards the close of its capacity, I take it, somewhat. Speaking of this well drilled so close to the first well spoken of by you, do you know what the pressure of that well was when drilled in, of your own knowledge?

A. No; I can't remember.

41 Q. And what use is that being put to?

A. We are using it right here in town.

42 Q. I mean the Farmer's well.

A. I don't know whether they are using that at all or not. They wasn't using it the last I knew of it. They wanted to sell it to us.

43 Q. So far as you know, then, the well adjoining the first well you drilled in at Stewartsville is not being used or drawn from at all?

A. Not that I know of. I don't know whether they are using that now or not, but I rather think not, because it has not been more than a month or six weeks that they were wanting to sell it yet.

44 Q. As you understand it there has been no draft upon the supply of that well at all?

A. Not on that one at all. They had it open for a length of time after they shot it. It didn't seem to affect ours.

45 Q. Your judgment as to the effect that the Farmer's well might or might not have had upon your well, so called, at Stewartsville is not derived from any actual test or measurement of the capacity, but rather from the noise and appearance of the escaping gas?

A. Yes, sir; and it didn't depreciate at that time while I was there—the pressure—at all, but I couldn't tell you just exactly what the pressure was at that time.

Mr. KINNEY:

46 Q. Did it produce any effect upon the stream of gas coming out that was visible?

A. Not at all.

420 Mr. POTTER:

47 Q. What is your opinion and judgment as to whether these two wells draw from the same supply?

(Objected to by defendants.)

A. That I really don't know. I don't pretend to be a practical man at all. I was not put in for a practical. We were after somebody to look for more territory, and we have got a good superintendent, and I don't pretend to be a practical man at all; nothing more than a common, ordinary man.

Re-examination:

1 Q. Mr. Potter has asked you something about the wells in town here, and particularly the Karg well. I will ask you how the wells here, and that one in particular, was used.

A. They were drawn on very heavily for our consumption here.

2 Q. How were they used aside from being used to supply you with gas?

A. They weren't used at all only for supplying our consumption here. They were drawn on for all that was in them through all last winter.

3 Q. What wells did you use for the purposes of exhibition and display and show?

A. Oh, that Karg well was used and run very heavy six months almost continually; opened off and on, anyway, for display.

4 Q. How was it run when it was run in that way?

A. Just wide open, I guess; as that man said, "Let her go, Gallagher."

Recross-examination:

1 Q. You have a population here in Findlay of about twenty or twenty-five thousand?

A. Yes; that is what they claim, anyway.

2 Q. And are using, in round numbers, daily—that is, in twenty-four hours—somewhere in the vicinity of not less than fifty million cubic feet of gas a day?

A. I think not less than that, and perhaps a little over. I don't pretend to know exactly now. We got nearly all of it. I think we are using very little excepting from those wells out north. I think it don't amount to anything what we are using from in town.

3 Q. How many miles of pipe have you here?

A. I couldn't tell that.

4 Q. Fifty miles?

A. I think more than that.

5 Q. Sixty or seventy?

A. I am satisfied we have more than fifty miles. There are two lines out to the Nickel Plate.

Also JEROME M. MARTIN, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. State your name, age, residence, and occupation.

A. Jerome M. Martin; age, 37; residence, McComb, Hancock county. I am in the hardware business.

2 Q. How long have you lived in McComb?

A. I have been there about 23 months.

3 Q. Do you know anything about the gas wells in the neighborhood of McComb?

A. I don't know very much about them; no, sir.

4 Q. Do you know whether there are any or not?

421 A. There is near Van Buren; that we are burning gas from.

5 Q. Are you acquainted with it?

A. I never was at the well but once. I was there once and seen the gauge put on it.

6 Q. When was that?

A. I don't remember the date; it was just about a year ago.

7 Q. Do you know anything about how long that well has been in use?

A. It has been in use two years that I know of or a little upwards.

8 Q. What has been supplied?

A. It has been supplying the village of McComb and the people along the line between McComb and Van Buren.

9 Q. How far is it from McComb to the well?

A. About eight miles.

10 Q. Do you know how many fires they have at McComb?

A. I do not exactly. I don't know whether I have it down or not. I think I have it on a book at home—the number of stoves we had a year ago, I think it was. I don't know as I can make a statement exactly.

11 Q. Can you approximate it?

A. I think it was in the neighborhood of four hundred stoves, as near as I can remember; I wouldn't be positive. I have got it down in a book at home.

12 Q. What have you in McComb being supplied with gas besides the houses and stores?

A. There is a brick and tile manufactory there that burns gas in the summer season, a grist-mill, and I run an elevator the year around, and a furniture factory. We have had a handle factory running right along, and I believe that is all that is burning any quantity outside of the stoves.

13 Q. How are the streets lighted there?

A. They are lighted with gas. What lights we have are gas—natural gas.

14 Q. How many are there of those?

A. I couldn't say.

15 Q. How are they burned—in what shape?

A. They are big torchlights.

16 Q. What sized pipes are they using there for that purpose?

A. I guess it is half-inch or three-quarters. I am not positive which, but I think it is half-inch.

17 Q. Do you know whether they have a gauge on them or any regulator, or whether they are run full open?

A. They are run open.

18 Q. How much of that time are they lighted?

A. Some of them all night and some of them only to closing-up time, when they shut them off, and some all night.

19 Q. How does your pipe run from the town of McComb to the well—along the highway?

A. Yes, sir; right along the public road. In some places they cross the fields where the road angles and makes jogs.

20 Q. How many residences are there on that road between McComb and the well?

A. I don't know how many. There is quite a good many. It is pretty thickly settled all the way through, and principally everybody burns gas along the road. There might be occasionally one that didn't.

21 Q. What else is supplied to McComb besides the gas from this well?

A. Not anything else.

422 22 Q. From your knowledge that well has been supplying that town for two years?

A. Yes, sir.

23 Q. When was it that you saw the gauge put on this well?

A. Just about one year ago.

24 Q. What did it register then, rock pressure?

A. I couldn't tell you exactly; it was in the neighborhood of four hundred pounds; it either lacked a few pounds or overrun a few pounds; I am not positive which, but it was very close to four hundred pounds. That was the only time I ever saw it tested.

25 Q. From the use of gas there what would you say as to there being any decrease in the amount of supply?

A. Oh, no; that time it was through a gasometer, and that kept it down so we didn't get the full pressure. We would get a great deal more of it if they allowed us to, but we get all we want, anyway.

26 Q. Do you know what the capacity of that well was at any given time?

A. No, sir; we are only using about forty pounds pressure.

27 Q. Measured at what point?

A. Measured at the gasometer at the edge of town.

Cross-examination by Mr. POTTER:

1 Q. The time that you saw the gauge put on the well it registered in the neighborhood of four hundred pounds to the square inch?

A. Yes, sir.

2 Q. Since that time you haven't seen any gauge of the capacity of the well?

A. No, sir.

3 Q. Do you know, of your own knowledge at that time, as to the cubic capacity of the well?

A. Only what this steam-gauge registered.

4 Q. All you know is that you have supplied to you and to those — use the gas in pipes a forty-pound pressure, and that is regulated at the gasometer?

A. Yes, sir.

5 Q. And the gas from the well is all supplied to the gasometer?

A. Yes, sir.

6 Q. And from the gasometer, by the weight of it, it is distributed into the service?

A. Yes, sir.

7 Q. So, when you say that the supply is the same now as it was then, you mean simply that the pressure, so far as the gasometer shows, is the same as it was then?

A. Yes, sir; and they have got a regulator or something in the gas office that shows the amount of pressure that we have all the time.

8 Q. That is, the pressure at the gasometer?

A. They have got an instrument in the office that shows any time

if it gets weak. Occasionally the pipes will freeze up at the well, and they can discover it right at the office, and that registers the amount of pressure that we have all the time.

9 Q. Do you know what pressure is required at the well to keep the gasometer supplied and give you a pressure of forty pounds to the square inch?

A. No, sir; I don't. There was a gauge at the well, but I don't remember just what that was.

10 Q. Suppose the pressure at the well was, say, one hundred pounds to the square inch, you would still get that pressure of forty pounds at the gasometer?

A. Yes, sir.

423 11 Q. So you get the same pressure, so far as your service is concerned, whether the pressure at the well is three hundred, or four hundred, or one hundred, or seventy-five pounds?

A. Yes; it would be the same thing.

12 Q. So, when you say the pressure and supply is the same as it was one year or two years ago, you mean simply that, as regulated by the gasometer, the pressure is precisely the same?

A. Yes, sir.

13 Q. But what the pressure is at the well, whether it has increased or diminished, that you don't know anything about?

A. No, sir.

Also RICHARD W. MCCAMEY, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. You may state your name, age, residence and occupation.

A. Richard W. McCamey; age, forty-five; residence, McComb. I am in the fire-insurance and real-estate business.

2 Q. How long have you been in McComb?

A. About nine years.

3 Q. Do you know anything about the gas wells about McComb supplying it with natural gas?

A. I have been at the well.

4 Q. How many are there of them?

A. One.

5 Q. Do you know when that well was drilled?

A. Two years ago last August, I believe.

6 Q. How long has McComb been using it?

A. Directly after the well was drilled in, as soon as they could lay the mains and pipe the houses.

7 Q. What other wells are there in the immediate vicinity of this well?

A. I have heard that there was a well, but not to my knowledge. I don't know anything about it.

8 Q. Do you know how many stoves are being supplied with gas from that well?

A. I think near four hundred, all told.

9 Q. What other purposes is it devoted to besides the supplying of stoves there?

A. For running boilers—what few factories we have there, and mills.

10 Q. What factories have you there?

A. A furniture factory and an elevator. The elevator shells a great deal of corn and grinds mill feed for shipping. They run ten hours through the day; and a large roller flouring mill uses the gas, and a tile and brick factory.

11 Q. Of what size is the tile and brick works?

A. They are a pretty large concern. They turn out a great deal of wares in the summer, from the time it thaws out in the spring until it freezes up in the fall. They are still running. They use a boiler.

12 Q. How are the streets lighted?

A. With natural gas.

13 Q. In what shape do they light the town?

A. With the flambeau light.

14 Q. What is the size of the pipe used for that lighting?

A. Not less than a half an inch, and I think it is three-quarters of an inch.

424 15 Q. How is that run—wide open?

A. Yes, sir; there is just a cut-off valve, and then turn it wide open and let her go at gasometer pressure.

16 Q. Do you know anything about how that well was used at first—that is, as to the pressure being kept back or not?

A. Oh, yes—that is, our gasman tells us; I don't know it personally; we used only one-fourth.

(Answer objected to on the part of complainants so far as relates to hearsay.)

17 Q. How is that gas supplied to the houses and measured, if at all?

A. It is not measured in any way, only as we receive it from the mains after passing through the gasometer. We all have all the gas we want. It is not measured. We have mixers, but if our mixers don't give us sufficient gas we ream them out, and they give us all the gas we want.

18 Q. So that the limit of your supply is limited by your desire in that respect?

A. Yes, sir.

19 Q. Do you know anything about what the capacity of that well was when it was drilled?

A. I don't know.

20 Q. Do you know what its pressure was?

A. I don't know.

21 Q. Do you know anything about its being measured at any time?

A. I know it was measured at one time. Our counsel went out with the parties owning the well to measure the well with the anticipation of buying it; that was all.

22 Q. When was that?
A. About a year ago.
23 Q. Were you there?
A. No, sir.
24 Q. So you don't know anything about that measurement?
A. I saw the parties go, but I didn't see it measured. I don't know anything about that.
25 Q. How does the supply furnished by the well now compare with what it was when you first opened it?
A. It is just as good as it was at the start.
26 Q. How does the consumption compare with the original consumption?
A. It is increasing all the time.
27 Q. About how much was the increase, would you say, within the last two years?
A. I don't believe I can state that. Some were afraid of it and wouldn't use it, but they have naturally come to it. Most all of our people now are using it; some were very timid about using it at first.

Cross-examination by Mr. POTTER:

1 Q. You know of your own knowledge nothing about what the supply or the pressure at the well was when it was originally drilled in?
A. No, sir; it made a terrible fuss.
2 Q. You know nothing of your own knowledge as to whether there has been an increase or a diminution in the supply at the well?
A. No, sir.
3 Q. And the gas is furnished, as I understand you, directly from the well to the gasometer?
A. Yes, sir.
4 Q. And the supply into the gasometer and the pressure out of the gasometer is regulated by a regulator?
A. Yes, sir.
5 Q. And the pipes from which you draw your supply—
425 their pressure is determined by the gasometer pressure, which is forty pounds to the square inch?
A. Yes, sir; but the factories and mills receive their pressure from the high-pressure lines.
6 Q. So far as the domestic use of it is concerned, the fact is that the pressure at the well might diminish one-half or two-thirds and still they would have the gasometer pressure of forty pounds to the square inch, provided the original pressure at the well was, say, three hundred pounds to the square inch?
A. I would think so.
7 Q. If the pressure from the well into the gasometer is sixty pounds to the square inch you would still get your gasometer pressure of forty pounds to the square inch, wouldn't you?
A. Yes, sir.
8 Q. As a matter of fact you know nothing about whether there

has been a diminishing, and, if so, to what extent, of the pressure and supply at the well?

A. No, sir.

Also W. R. CARNAHAN, of lawful age, being first duly sworn, testified and deposed as follows:

Direct examination by Mr. KINNEY:

1 Q. You may state your name, age, residence, and occupation.

A. W. R. Carnahan; age, forty-six; residence, in Findlay; occupation, dry goods.

2 Q. How long have you lived in Findlay?

A. Pretty near thirty-three years.

3 Q. Have you had any experience in the use of natural gas as an illuminant?

A. We use it in the house and at the store.

4 Q. How do you use it—in what sort of burners?

A. It is like these; what is called a "Jumbo" burner; like the ordinary gas burner, only about twice as large.

5 Q. What other kind of burners, if any, do you use?

A. I have now got one of these Welsbach burners.

6 Q. Will you describe that as near as you can?

A. That makes a light something like the incandescent electric light. There is a wire wick that the gas strikes against and burns and makes a solid flame.

7 Q. Using a Welsbach burner, what sort of a light do you get?

A. We get a steady light and we get a whiter light than we get by burning the gas in an ordinary burner. It comes the nearest to the Edison incandescent light of anything I know of. I don't think it is quite as clear as the Edison light.

8 Q. What, if you know, is the comparative cost of natural gas used in the Welsbach burners as an illuminant and either electric light or artificial gas?

A. I am not prepared to answer that question. I have not taken the trouble to investigate. I know what they charge me a month for the use of the burner, and that is twenty-five cents a month. I don't know what the electric light men would charge for an incandescent light.

9 Q. How much does your gas cost you per light or per burner?

A. We pay five cents a month, and then the higher the
426 number—there is a discount made; so many tips are so much; five cents is the highest. When we get up to a certain number it is a little less per light. They have a scale here—the Findlay Light Company.

10 Q. Then, if I understand you, you pay twenty-five cents per month for your burners and five cents per month for each tip or burner for the gas?

A. Yes, sir.

11 Q. At that each burner costs you thirty cents per month?

A. Yes, sir.

12 Q. With a discount if you use above a certain number of burners?

A. Yes.

13 Q. State what that number is.

A. I don't know that; they have a schedule. I can't remember what that is.

14 Q. How many burners would be necessary to use in order to light a good-sized room in a residence?

A. One of those Welsbach burners will light a room very nicely—an ordinary-sized room.

15 Q. What do you mean by an ordinary-sized room?

A. Say a room fifteen to sixteen feet square; sufficient for reading and all purposes.

16 Q. From your experience in the use of natural gas for illuminating purposes what would you say as to its desirability for that and as to its being economical or otherwise?

A. Take it to simply light up a room—of course it will light up a room as well as anything else; but for a light to read by or write by, unless you have something like this Welsbach burner, I don't think it is so nice.

17 Q. I mean with reference to the Welsbach light.

A. Where there is a Welsbach light it gives a very satisfactory light.

18 Q. Have you had any experience in the drilling and operating of gas wells?

A. Yes, sir.

19 Q. I wish you would go on and state what your experience has been and what wells you have drilled, &c.

A. I drilled, in 1887, four wells, and then I drilled three this last summer—two north of Van Buren and one near Stewartsville—and then I have been interested in two others that I have had the charge of while they were drilling; one of them I didn't pay much attention to. We drilled three on the M. C. Whitely Addition in 1887, and one on the Miller land in the same year.

20 Q. Where is the Whitely Addition?

A. It is in the southeast part of the city of Findlay.

21 Q. And those wells were drilled in what part of 1887?

A. I commenced drilling my first well on the Whitely Addition in April. We finished that up, and along in May we drilled the second one on the south part of the addition—along in May; and along in the latter part of June and the early part of July we drilled the third one on the east part of the addition—about the centre of the addition on the east side; and then in December, 1887, I drilled a well on the Miller land, about a mile and a half south of the Whitely Addition and within the corporation of Findlay.

22 Q. Has that last well been in use constantly?

A. The last well has not. It was used for about six months, and we didn't have any use for it—didn't need the gas—and we closed it up, and it is now owned by the city of Findlay.

427 23 Q. And these other wells, aside from the three in the southeast part of the town, have those been used by you?

A. Yes, sir.

24 Q. How is it in reference to the three wells in the Whitely Addition?

A. They have been in constant use; not ever since they were drilled, because they were drilled to supply the houses and the window-glass factory on the addition—a ten-pot window-glass factory. They commenced building the window-glass factory in the summer, and they started it about the first of October, 1887, and they have been in constant use ever since then. I laid pipes at the time we drilled the wells from the wells to the factory, and they didn't get the factory completed until about the first of October, 1887.

25 Q. Since that time you say they have been in constant use?

A. Yes, sir.

26 Q. Supplying the factory and what else?

A. The houses on the addition.

27 Q. About how many houses are there?

A. There are now about thirty houses there.

28 Q. Are they all using gas from those wells?

A. Yes, sir.

29 Q. Your factory is what size?

A. A ten-pot window-glass factory.

30 Q. Is there anything else using this gas?

A. I believe not.

31 Q. Do you know, approximately, about how much gas is being used from those wells at any time?

A. From the three wells—well, I should say that there is about four million feet in the three wells.

32 Q. Who owns and is operating this factory?

A. The Ohio Window Glass Works.

33 Q. What, if any, interest have you in it?

A. I have none.

34 Q. What, if any, interest have you in any of these wells?

A. Well, I have contracted to supply the window-glass works with gas. I put down the wells.

35 Q. You own the wells?

A. Yes, sir; I own the wells.

36 Q. What was their capactity when drilled, if you know?

A. Well, the first well ran a little over a million, the second well (on the south part) ran a little over two millions, and the third (on the east side) ran a little over a million, so I had counted that I had, safely, over four million feet of gas.

37 Q. How much gas has been used from those wells from the time they were turned into supplying these houses and factory up to the present time?

A. Well, they have been in constant use to supply the factory when the factory was running. They have a regular time of shutting down. They generally shut down the last of June and are idle for two months—July and August. Last year we started up again in their regular time, about the first of September, and run until shutting-down time again. The gas has been used there in that way, and, in addition to that, what has been used in the houses.

38 Q. While these enterprises are running about how much is the consumption per day?

A. Well, as near as I can get at it, we should take about three million; perhaps not as much as that; maybe it would be two and a half.

39 Q. Have you made any measurements of these wells re-
428 cently or since they were open?

A. I measured them at the time they were drilled in, but I have not put a gauge on them since that—that is, not lately.

40 Q. What would you say as to the present capacity of those wells compared to their capacity at the time they were drilled in?

A. I don't see any difference.

41 Q. I wish you would go on and state briefly what means you have of forming an opinion on that subject.

A. Well, there does not seem to be any let up in the supply and pressure on the lines. Everything of that kind seems to be just as great as ever. There has been no sign of any salt water or oil or anything of that kind. The pipes have always been perfectly dry. I don't see but what those wells are just as good to-day as they were when they were first drilled in, as far as I could tell.

42 Q. How much experience have you had with this field—this Northwestern Ohio natural-gas field?

A. Well, I have had this experience right here in what we call the Findlay field proper, right here at home, and I drilled in those two wells at Van Buren this summer, and the one at Stewartsville, and also had charge of the drilling of a well—the Coontz well—in the southeastern part of the city, on the Blanchard Avenue Addition. I have the last, I might say, for the last three years or ever since I drilled the first well. I have tried to see nearly every well that was drilled in—nearly all of the new wells around through the territory. Of course, I have not seen all of them, but I have seen a large number of them.

43 Q. Have you a knowledge of the geographical limits of the territory as it is now developed?

A. Well, I have, to some extent.

44 Q. What would you say as to there being new territory discovered and developed from time to time—what has been done?

A. In the way of discovering new territory?

45 Q. Yes.

A. Well, take it a year ago this time, I don't think there was any of us here in Findlay thought that there was as big a gas field as we have found this spring and summer in Stewartsville.

46 Q. That field has been developed within a year, then?

A. Yes, sir—that is, since the drilling in of the Mellott well; that was the starter there.

47 Q. How does that field compare with the field discovered prior to that, in gas development—as good or better?

A. It is better; the drill shows that; especially the wells at Stewartsville and Van Buren are larger—that is, on the average.

48 Q. If you know of any other territories having been discovered

within the last year or two years I wish you would state, either right there or at any other place in Northern Ohio.

A. Nothing has come within my personal knowledge.

49 Q. What would you say as to the chances of the extension of the territory?

A. I think our territory here yet comparatively undeveloped. I think there will be lots of as great surprises to us as there has been in the case of the Stewartsville field.

50 Q. Have you any opinion as to the probable duration of the supply of gas in Northwestern Ohio?

A. Well, as far as my opinion is concerned, I don't think that
429 I will ever live to see the day that I will not have gas to burn in Findlay.

51 Q. What would you say as to whether the business of constructing and operating a natural-gas plant is or is not a peculiarly hazardous and dangerous business financially?

A. I don't think it is any more than any other business. I think people ought to have a knowledge of the businees—just like the dry-goods business or anything else—to know what they are doing. Of course when a man drills a well he can't tell whether he is going to get a little one or a big one; the drill will tell that.

Cross-examination by Mr. POTTER:

1 Q. The first gas territory in Northwestern Ohio was discovered in the vicinity of Findlay, as I understand it?

A. Yes, sir.

2 Q. And embraced, in round numbers, what area of miles?

A. The first well we drilled here was the Oesterlin well; that was in—I don't know that I can give you the exact date; at least four years ago.

3 Q. What was the capacity of that well?

A. It was a small well. I think it ran about three hundred thousand.

4 Q. What became of it?

A. It is still in use in the city mains here in Findlay.

5 Q. Where does that lie?

A. It is east of Findlay.

6 Q. Has it been abandoned—its use?

A. That is not my understanding.

7 Q. It is one of the city wells?

A. Yes, sir.

8 Q. Going back to the question of the area of gas territory in and about Findlay, what is it?

A. We drilled the Ballard well three miles south. You may say that that is about as far south as we know. There has not been anything near the Ballard well further south, so we don't know how far it extends. That was of about nine millions capacity; it is in use by the city, supplying the mains.

9 Q. It was the last you heard of it?

A. It is now, to-day, in use.

10 Q. When was it drilled?

A. The Ballard well was drilled in 1887. I can't give you the month, but it was along in the summer of 1887.

11 Q. You know nothing, of your own knowledge, what the present capacity of that well is?

A. No, sir.

12 Q. Go on and give the developments of the field.

A. Take it running west from town here, I guess the Karg well was about the only gas well, though I believe there are more over in the north part of town and a little to the west.

13 Q. What is the condition of the Karg well?

A. I don't know; it is owned by the city.

14 Q. Don't you know that it can't be used on account of its being substantially exhausted?

A. No; I don't know that.

15 Q. You knew that it was flowing oil and some salt water, didn't you?

A. No; I have not heard of that.

16 Q. Haven't you heard that the supply in that Karg well had diminished and that the well itself was in such condition that the well was impracticable to be used?

A. No, sir.

430 17 Q. Or partially so?

A. No.

18 Q. Had you heard nothing of the diminishing of the supply in the Karg well?

A. Nothing that I would pay any attention to. I never have heard it from authoritative sources, and I have no direct knowledge of it myself.

19 Q. Go on with the development of the territory now.

A. Then take it east, as far as the developments are concerned here, it would come in the M. C. Whitely Addition; that is two miles east. That is as far east as there has been any drilling done. Those are; the ones that I own. Then take it north, the Heck well was about as far north—that is, among the first wells—about two miles and a quarter.

20 Q. These wells being the boundary limits of the territory, how many wells have been drilled in, in round numbers, from which a supply of gas has been obtained?

A. Without speaking of the amount of them I should say about fifteen.

21 Q. Of those fifteen wells about how many were or are owned by the city and were used by the city at one time—some eleven or twelve of them?

A. The city—we have three wells that we own, and the Coontz people have one, which is four; and Heck sunk one; that is five; the Bond well down here, owned by Mr. Bond, is six; that is owned by private individuals; that is all I think of at present.

22 Q. What wells are owned and operated by the city now?

A. In the original territory?

23 Q. Yes.

A. The city owns about all of them; they have not sold them.

24 Q. Did you know that the city at the present time was not using the Findlay wells, but was drawing its entire supply from the Stewartsville territory?

A. They are not doing that; they are using some of the city wells, too.

25 Q. You hold no official position in the city, do you—that is, as trustee or anything in the conduct or management of the gas supply to the city?

A. No, sir.

26 Q. Are you able to state, in round numbers, the amount being supplied daily to the city of Findlay—the extent of the consumption of gas daily here at present?

A. All I could tell is what I have heard.

27 Q. From your knowledge and observation?

A. Well, I should think fifteen millions.

28 Q. That would be your judgment of the maximum limit?

A. Yes; I should think that. I have never figured on that, you know, as to the consumption or anything of that kind. I should think it would be on the outside.

29 Q. You are supplying from three wells about three million cubic feet per day?

A. I should judge that our consumption out there, with the houses and all, now is in the neighborhood of three millions.

30 Q. Since you drilled those three wells in have you made any test of their rock pressure or supply at the well?

A. Not since I first drilled them in.

31 Q. What was the rock pressure when you first drilled them in?

A. Four hundred and thirty pounds.

32 Q. How did you determine the quantity of supply at the well daily?

A. By pressure; well, by putting the gauge on; that is the way the wells are ordinarily measured.

431 34 Q. That is steam-gauge pressure?

A. Yes, sir.

35 Q. So that you say the pressure and capacity are both determined by the pressure on the steam-gauge at the well. Is that it? You say the rock pressure is 430 pounds at a certain length of time. Having the orifice given, you determine the escapement, do you?

A. No; to find the rock pressure we shut it in and put the gauge on. If we want to take a measurement of a well we open it and let it go down to its natural flow and then put the gauge on and test it in that way.

36 Q. What did you find the natural pressure, then, after the rock pressure is down to its natural flow?

A. I couldn't tell from memory.

37 Q. In round numbers what was it?

A. Do you mean as to the production of the well?

38 Q. I mean the pressure.

A. That I can't tell, because I didn't try to fix it in my mind.

39 Q. Can you give us somewhere near what it was?

A. I don't think I could.

40 Q. Was it fifty pounds or one hundred or one hundred and fifty?

A. I know we measured it and figured it up at the time, what it showed, but I don't recollect now what it showed; it was some time ago. It is hard to remember.

41 Q. It was from the other pressure that you determined the quantity of the flow?

A. Yes, sir.

42 Q. Your judgment is that this natural gas has a limit of flow through an ordinary gas-burner, and that while it gives a light it is not a pleasant light to read by or study by or work by?

A. It will do very well to sell goods by and such things as that, but if I wanted a light to read by I would rather have one not so flickering.

43 Q. Take it for a light for house purposes.

A. If I wanted to light up the house I would as soon have that as anything else, but if I wanted to sit down and read I would rather have something steady.

44 Q. Have you made any test yourself to determine the life of a well or the duration of a well left flowing at its full capacity, say, for instance, a well drilled in flowing five million feet every twenty-four hours, as to what the same well would show at the end of three years from that time?

A. No; I have not.

45 Q. Do you know of your own knowledge the duration of a well with the capacity of five to ten million cubic feet per day flowing continually?

A. I do not.

46 Q. Did you know that the Findlay field—that is, the wells immediately in the city—that after the use of them for the past three years, drawing continually on the supply, were becoming so exhausted that they were closed in and other wells being drawn from, say in the vicinity of Stewartsville?

A. They are using——

47 Q. Do you know of any of the city wells giving out, in other words?

A. They are using the Ballard well. The only well that I understand now is not being used is the Altman well. That well was drilled too deep at the start. Any well can be ruined. Of course, the salt water or oil lies close to the gas, and there is a time to stop.

432 Re-examination:

1 Q. I will ask you again what you think is the probable duration of the wells in the Northwestern Ohio field or in the Northwestern Ohio territory, and give it, if you can, in years.

A. I don't believe it will ever be exhausted.

Recross-examination:

1 Q. What is the extent in miles north, east, south, and west of

the gas territory of Northwestern Ohio, as you understand it—about?

A. I don't know much about Wood county. That would be a very hard question for me to answer. I know something about the developments made right here at home; but, take Wood county, I don't know anything about it.

2 Q. Your knowledge of the subject is confined to the Findlay territory, so called, and its surroundings?

A. Yes, sir.

3 Q. Within a radius of how many miles—five miles?

A. Three and a half south and eight and a half miles north—that would be about twelve miles north and south—and east two and a half miles; west about a half a mile you strike oil—about three miles.

4 Q. Are you able to give any estimate as to the daily consumption or production of gas in the territory last named, in feet?

A. What the wells will turn out? No; I am not.

5 Q. Can you give any estimate or approximate what the supply or production is in the territory named here?

A. That would be a pretty hard thing for me to do now. Most of the wells drilled in here were small wells, comparatively.

6 Q. Can you give any estimate of the duration of the supply in the territory that you are acquainted with?

A. The Karg was about the only big well we had right here. No; I can't give any estimate.

7 Q. Your judgment is that the supply of gas will always continue substantially as it is now?

A. Yes; I believe you will never exhaust this territory.

8 Q. Do you mean that the wells will always continue to supply the same quantity of gas?

A. That is my judgment; yes, sir.

9 Q. Your opinion is that a well that is now supplying a million cubic feet per day will always supply a million cubic feet per day?

A. Yes, sir.

Also E. B. PHILIPPS, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. You may state your name, age, residence, and occupation.

A. E. B. Philipps; age, 36; residence, Findlay, Ohio; occupation, superintendent of the gas works.

2 Q. How long have you been superintendent of the Findlay gas works?

A. I was superintendent of the old Findlay Gas Light Company for eleven years, and then I severed my connection with them, and I became employed by them in May, 1889—by the city gas works proper—that is, of the corporation plant—and have been in their employ about two years.

3 Q. What do you mean by being employed by the city
433 gas works eleven years ago?

A. That was the Findlay Gas Light Company for eleven years; that was the artificial, and they merged into the natural gas upon the discovery of natural gas in Findlay.

4 Q. Since they have had a board of natural-gas trustees how long have you been in their employ?

A. Since the third of June, 1889, this year.

5 Q. How much experience have you had in the natural-gas business?

A. Between four and five years.

6 Q. At what points?

A. Findlay. I have also been engaged as engineer in other parts of the country, contracting and putting down lines and putting in plants, and have been engaged in testing wells and testing territory in different parts of this country, in the West and in the South.

7 Q. What have been your particular duties with reference to the gas business—that is, what branches have you paid particular attention to, if any?

A. My duties here in both companies have been as superintendent and manager of the different plants. When not engaged with them my duties have been in contracting for lines and superintending the construction of lines and preparing plans and specifications for plants and the general duties of a gas engineer.

8 Q. How long have you lived in Findlay?

A. Thirteen years.

9 Q. Have you had any experience in the cost of constructing gas lines?

A. Yes, sir.

10 Q. How extensive has that been?

A. I have put in six plants under contract, and have superintended the construction of two others in addition to the six that I contracted myself, and have been engaged in preparing plans and specifications in connection with my work for various gas lines. I have prepared as many as a dozen plans and specifications with estimates of cost and the general details of construction of those plants.

11 Q. What gas plants have you been engaged in constructing or superintending the construction of?

A. I superintended the construction of the St. Mary's plant, in Auglaize county; the Wapakonetta, a small plant that was put in at Morley. I contracted and put in the Munster line, in Auglaize county. I have had charge of the construction of the Findlay line, of the present line, put in by the trustees this year.

12 Q. What, if you know, would be the cost of laying a natural-gas pipe line of ten to twelve inches between Toledo and what is known as Stewartsville, a distance of thirty-six miles or thereabouts, including in that cost the total cost of constructing the line, exclusive of the cost of material?

A. I would estimate the cost of such a line of ten or twelve inch pipe——

13 Q. Suppose you give each one, if there is any difference between them?

A. I would estimate the cost of a ten-inch line, such as you describe, exclusive of the cost of the pipe, at from fifteen to eighteen cents per lineal foot, a twelve-inch line; such as you describe, without making any estimate of the cost of the pipe, at from nineteen to twenty cents per lineal foot.

14 Q. That estimate includes what?

434 A. That estimate includes taking the pipe from the cars and burying it, connecting it so as to make it a continuous line. To cover the ground more fully, it would include the hauling, excavating and backfilling and the laying complete, jointing the pipes. What I have reference to is the screw joint.

15 Q. What is the difference between the screw joint and the lead joint in cost?

A. It would depend altogether upon the kind of joint. The ordinary lead joint would cost from three to four cents per foot more than the screw joint.

16 Q. What is the difference between the joints—the screw joint and the lead joint?

A. The screw joint is an ordinary thread cut on the end of the pipe, by which each pipe is screwed to the other and made. The lead joint consists of a belt or collar into which lead is poured, and which is calked after it is laid.

17 Q. How many different kinds of lead joint are there?

A. There are quite a number of lead joints, including patent joints. There is the Converse joint, used extensively throughout the country, and then there is the ordinary bell lead joint, which has been used during the last year, in which the belt is wedged or shoved onto the wrought-iron pipe, called the hub-and-spoke joint. There are various other patent lead joints, made by the use of a loose collar or a tight collar fastened onto one end of the pipe; but the joint is substantially the same, only its being in the shape of a socket or bell, and the manner of putting it together. We have also what is called the lock joint, used in putting it together. The manner of constructing them is very much the same.

18 Q. Would there be any difference in the expense of laying the different kinds of lead joint which you have spoken of?

A. Not substantially. Some lead joints claim to use less lead than others, but substantially it takes about the same amount of lead to make the bell joint with one plan or the other.

19 Q. What is the best joint for the pipe?

A. I consider the Converse joint.

20 Q. I mean of the whole—lead or screw?

A. For pipes up to twelve inches diameter I prefer and consider the screw joint the best. For pipes above that it is necessary to make them of lead, for they cut no thread on pipes above twelve inches in diameter. We can't procure screwed or threaded pipe above that.

21 Q. What would be the cost, if you know, of constructing pipe lines of from four to eight inches in diameter—four, six, and eight inches—through the streets of Toledo, including in that estimate everything except the cost of the material?

A. Where ordinary pavements are encountered the expense of laying lines of from four to eight inches in diameter or of pipe from four to eight inches in diameter would be from ten to fifteen cents per lineal foot.

22 Q. What do you mean by "ordinary paving"?

A. Macadam, boulders, cobble-stones I would consider ordinary pavements; but where they have patent paving, as in the shape of asphalt or brick, which is being used within the last few years, as in Columbus and other cities, the expense would be from four to five cents per foot more, depending upon the character of the paving.

23 Q. What difference, if any, do you make between the
435 cost of laying four and eight inch pipes under those circumstances in any case?

A. The estimated cost of laying a four-inch pipe would be from eight to ten cents a foot. The estimated cost of laying six-inch pipe would be from ten to twelve cents a foot. The estimated cost of laying eight-inch pipe would be fifteen cents per foot. In the matter of laying—there is not very much difference in the actual laying of the pipe between the four and the six (inch). The excavation would be the same. The contractor can lay, of course, more four-inch pipe in a day than he can six-inch, but the difference in the actual expense would not be very great. The trench would cost about the same, the hauling would cost the same, and the difference in the laying would be in favor of the four-inch. He can lay more four-inch pipe in a day than he can six, but not enough to make any very material difference in an approximate estimate.

24 Q. Are you able to estimate on the cost of material for such lines as I have designated—the cost of the pipe?

A. The price of piping having varied, it would be impossible to make an accurate estimate as to what the line could be laid for at the present time without getting special prices. The ten-inch pipe, as far as my knowledge of the pipe market is concerned—I could not give the cost of the ten-inch pipe without securing figures direct from the mills; but in the last year it has been about at $1.25 per foot. Eight-inch pipe has been 90c. per foot.

25 Q. The cost of the material, of course, will depend on the market price at the time when you are ready to use the pipe?

A. Yes, sir.

26 Q. What sized pipe would you say would be necessary or proper to be used in constructing the main line, such as I have designated, a distance of perhaps thirty-six miles?

A. I would advise a twelve-inch line.

27 Q. Connected with a twelve-inch line what amount of pressure would it require at the wells to send gas through this line that distance and still retain at the wells a sufficient amount of back pressure?

A. Two hundred pounds.

28 Q. What is the rock pressure at Stewartsville?

A. Three hundred and seventy-five pounds.

29 Q. I will ask you whether or not that pressure is sufficient to furnish gas to Toledo, a distance of thirty-six miles, through a

twelve-inch pipe and still retain at the wells a sufficient back pressure.

A. Yes, sir.

30 Q. There is a well in Findlay known as the gas-works well, is there not?

A. Yes, sir.

31 Q. Can you state when that well was drilled?

A. That was drilled in December, 1884.

32 Q. What use has that been put to since it was drilled?

A. It has been used on the lines continuously and is in use on the lines now.

33 Q. What was the pressure in the well at the time it was opened—first drilled?

A. Do you mean the confined pressure or the rock pressure?

34 Q. Yes; that is what I had reference to.

A. The well was never tested for open pressure when it was drilled in. The rock pressure was four hundred lbs.

436 35 Q. Was it tested for anything except the rock pressure?

A. It was shut in and tested as to the number of pounds it would run up after being shut in a certain length of time; that was the only method we had of testing wells and comparing them one with another.

36 Q. That is different from rock pressure?

A. Yes, sir.

37 Q. What would that indicate?

A. The indicated comparative capacity of one well with another; it was used as a means of comparison and forming some idea of the volume of the well.

38 Q. What was that pressure—what was the result of that test at that time?

A. The well was turned on full and allowed to escape and then shut in and a gauge put on it, and it ran up to seventy-five pounds in seven minutes and a half.

39 Q. When was that?

A. That was in December, 1884.

40 Q. What was the capacity of that well—what did that indicate?

A. About 250,000 cubic feet per day.

41 Q. Has that well been measured in the same way since that time?

A. I measured the same well in the same manner about two weeks ago.

42 Q. What did that measurement show?

A. It ran up to seventy-five pounds in ten minutes.

43 Q. That indicated what capacity?

A. I have not made any estimate or made any figures on the latter test as far as the capacity of the well is concerned. The first measurement was taken by turning the gas into a gasometer or gasholder and the volume calculated by the length of time it took to discharge or to fill the holder with a certain number of thousand cubic feet. We had no accepted method of testing wells. The well

was close to the gas works. They ran a line to the well from the gas-holder and tested its capacity in that way.

44 Q. How did you do it this time?

A. We made no test this time, for the holder has been taken away since, and I have not tested the well as to volume.

45 Q. What would the difference in time that it took to raise to the seventy-five pounds indicate, if you can tell, as to the comparative capacity of the well at this time and when it was measured first?

A. Having never made any calculations in this plan or by the method of testing the number of pounds to run up to in a certain length of time, I could not say what the present test of the well would give according to the test made here two weeks ago.

46 Q. That well has been in use since what date?

A. December, 1884.

47 Q. What is it used for now?

A. It is used for supplying the district school-house with gas.

48 Q. How long has it been used for that purpose?

A. For about two years.

49 Q. Can you give approximately the geographical lines of the known gas field in Northwestern Ohio now?

A. The Northwestern Ohio gas field extends from a point three or four miles southeast of Findlay to Bowling Green, in Wood county, extending north from this point three and a half or four miles south of Findlay to Bowling Green. It extends as far east as the vicinity of Tiffin, Ohio, and from a mile and a half to two miles west of Findlay.

437 50 Q. What extensions have been made, if any, in this gas field within the last two years?

A. Gas has been found in the Stewartsville field in large quantities in the last two years, and some operating has been done west of Stewartsville in which gas has been found, and also east of Stewartsville.

51 Q. How does the territory that has been opened up within the last year compare in production with the territory that was opened before that?

A. The wells, on the average, are much larger than the wells which were first developed in the Findlay field.

52 Q. What would you say as to the chances of further extension of the field?

A. I would consider the chances as fair for getting good wells and wells flowing as large as we have found within the last year or as have been drilled within the last year.

53 Q. Other wells in the same territory not developed or in other territory?

A. In the Northwestern Ohio field.

54 Q. What are the chances of the lines of the field being extended by further developments?

A. As far as that is concerned, I could not judge. There is considerable operating going on all the time, and I wouldn't be surprised to see the lines of the field considerably increased, so far as

the limits of the field being concerned. It is almost impossible to tell where you can get gas without drilling for it.

55 Q. What would you say as to the business of constructing and operating a natural-gas plant being a peculiarly hazardous or dangerous business financially?

A. I would not consider it a peculiarly hazardous or dangerous business financially, taking the matter in general; of course it depends altogether upon the supply, and as far as the field has been developed the supply seems to be sufficient to invite the investment of capital in the business without taking into consideration any extraordinarily hazardous risks financially.

56 Q. Do you know personally of any new lines that are now being or have recently been constructed in this field?

A. I know of none except by current report. The Detroit line and the Sandusky line and the line to Kenton are now being constructed.

57 Q. Do you know, of your own knowledge, where Carey gets its gas?

A. It gets its gas from the Findlay field.

58 Q. How long has that line been in operation?

A. That line was laid this summer; it has just been completed.

59 Q. Where are the Carey wells?

A. One of their wells is on the Wolfe farm.

60 Q. Where is that from Findlay?

A. It is northeast, about four miles from Findlay. The main bulk of their supply they get from that vicinity.

61 Q. How long have they been getting gas from that immediate vicinity? State whether it is a new or an old field.

A. That field is not new; it has been developed within the last three years. The Thorn tree well is in the immediate vicinity, right in that part of the territory.

438 62 Q. Where does Kenton propose to get its gas, if you know?

A. From the same field.

63 Q. That is not in what is known as the Stewartsville field?

A. It is east of Stewartsville.

64 Q. What township is that in?

A. I don't know.

Cross-examination by Mr. POTTER:

1 Q. What is, in your judgment, the life of a natural-gas well, its full capacity being drawn continuously?

A. That I cannot say—satisfactorily.

2 Q. About what would you estimate, from your knowledge, experience, and observation in the business?

A. I could not satisfactorily make any estimate on a natural-gas well.

3 Q. I mean for practical uses, what is the shortest duration of time you know of—that is, with their full capacity drawn on continually, what is their longest duration?

A. I have no data, positive data, as to the life of a gas well. As far as the shortest or the longest life of a gas well—the life of a field is, of course, only determined by actual practical data. The field here has not given us that practical data as far as telling us whether it is exhausted or not. We are using gas from the field and have been using it for the last five years. The supply is still here. As to how long it will remain I could not say or form any practical estimate.

4 Q. Do you say that the same supply is here that there was five or six years ago?

A. The supply is here. Substantially speaking, the field itself remains the same. I have made no accurate test or have made no practical test of the difference in pressure at the present time and the time that the field was developed.

5 Q. Are you able to form or to give any opinion as to the duration or life of a gas well that has had its supply drawn on continuously?

A. No, sir; I am not.

6 Q. Can you form any notion or idea as to the probable duration of such a well?

A. No; I cannot.

7 Q. When was the Karg well drilled in?

A. In January, 1886.

8 Q. Do you know what its capacity and pressure was at the time it was drilled in? How much was it estimated?

A. Its confined pressure was four hundred pounds; its volume was twelve million three hundred thousand.

9 Q. What is it to-day?

A. I don't know. I have not tested the well.

10 Q. Is it now in use as a gas well?

A. No, sir; it is not in use at the present time.

11 Q. What is the trouble or difficulty?

A. We are resting the wells in Findlay at the present time.

12 Q. How long have you been resting them?

A. Some of the wells were shut off about two months ago—about the first of October; not all of them, however.

13 Q. How many have you here that you are drawing on?

A. We are using four wells at present.

14 Q. At their full capacity?

A. We don't use our wells to their full capacity, if you mean the full, open capacity.

439 15 Q. Full, open pressure?

A. No; we don't use our wells at the full, open pressure.

16 Q. What is the occasion of shutting in or closing and giving the Findlay wells a "rest," as you call it?

A. In handling or using any gas field it is absolutely necessary, in order to prevent the pressure of the field from being reduced below the safety point, to shut certain parts of the field in and use other parts and not draw from the field to its fullest extent.

17 Q. Why?

A. Among the majority of natural-gas engineers it is conceded

that the field will last much longer if the rock pressure is kept up to from one hundred and fifty to two hundred pounds pressure and not allowed to go below that, and the use of natural gas in Findlay has been increasing very rapidly within the last year, and we have drawn from the Stewartsville field and have kept the pressure here in the Findlay field proper at from one hundred and fifty to two hundred pounds, and not allowed it to go down below that by using our new field and keeping the pressure up from the new field.

18 Q. You found, then, in the draft upon the Findlay district or field, so called, that the pressure or supply was being reduced to what you call the danger line?

A. No; I have not found the pressure or supply so reduced, but it is a fact known among gas engineers that by keeping the pressure in the field at from one hundred and fifty to two hundred pounds it keeps the fluid out of the wells and keeps the wells dry and keeps the gas rock from being filled with fluid.

19 Q. Had you any indication in the use of your wells here that the danger point was being reached or had been reached?

A. In the beginning of the development of the Findlay field, in drilling some of the wells southeast, we found traces of fluid or salt water, and several wells were drilled right on the edge of the salt-water territory. Those wells, when drawn upon largely and used to their maximum extent, began to show signs of fluid.

20 Q. What is that an indication of?

A. That would be an indication that unless the rock pressure was kept up to a certain point that the wells contiguous to the salt-water territory would be apt to show traces of salt water, or the salt water would encroach upon the wells or upon the gas-bearing rock and would shut off or fill up the gas rock.

21 Q. Was that demonstrated in your field here?

A. That was demonstrated in the field here; yes, sir.

22 Q. Before your development of the Stewartsville field you had in Findlay and its vicinity some eleven wells, as I understand it, that you were drawing on for your supply here—ten or eleven wells?

A. There were ten or eleven wells drilled at that time; they didn't all belong to the Findlay Gas Light Company; they were not using them all?

23 Q. What is the company that you are superintendent of?

A. The city gas works; that is the corporation plant.

24 Q. How many wells have they in the city that they have been drawing on—those that are shut in and those not shut in?

A. Eleven wells.

440 25 Q. Seven of those have been shut in. Is that it?

A. Yes, sir.

26 Q. How long since?

A. Since the first of October.

27 Q. Isn't it true that the pressure and supply from the seven wells that have been shut in have become so diminished that the supply from them was not sufficient in practical pressure or force as to give satisfaction in the service?

A. No; it is not true that the supply or pressure from them was not sufficient in character to give service. In the history of last year in the gas supply it was found that the number of wells, as far as their average volume was concerned, was entirely too small, and that necessitated the drilling of more wells and in territory where we could obtain larger wells, or, in other words, the eleven wells were not sufficiently large to supply the city of Findlay.

28 Q. And that, together with the other reason assigned, was why you shut in seven of them or closed down seven of them?

A. The reason that seven of them were closed down was to rest the wells and to rest this part of the territory. The four that we are using now we are using those more particularly because they are connected with several factories which depend on those for their supply alone, and those we could not shut in, as our lines did not reach those factories.

29 Q. Is the Karg well one of those eleven wells?

A. Yes, sir.

30 Q. Are you not able to state what the trouble is with the Karg well?

A. I have not examined personally the Karg well of late. The Karg well, with the balance of the wells that were shut in, was shut in for the purpose—for the purpose of resting the territory in general and not using from this part of the territory at all.

31 Q. Did the Karg well blow any oil or salt water before it was shut in or closed in?

A. Not to my knowledge.

32 Q. Did any of the other wells show any indications of oil?

A. Not to my positive knowledge.

33 Q. Was it reported to you by those who had charge or personal superintendence of the wells that they were blowing oil or salt water, any of them, or any complaint that they were?

A. One of the wells in the southeastern part or southeast they said was reported to show signs of fluid—not to an alarming extent—but yet I never saw fluid coming from it myself.

34 Q. As superintendent of the lines and wells, whilst you may not have personal knowledge of the exact condition of the wells, I suppose any difficulty or improper working of the well is reported to you or known to you?

A. Yes, sir.

35 Q. Was it ever reported to you that the Karg well was blowing oil or fluid, and for that reason it was temporarily abandoned or shut in and not drawn on?

A. Yes; the Karg well has been reported to me as showing signs of fluid.

36 Q. What is that an indication of—a gas well, after having been drawn on for a considerable length of time or a given length of time and suddenly showing fluid or throwing fluid or blowing fluid—what is that an indication of?

A. It is an indication that the well has been drawn on too heavily; that the pressure has been allowed to go to too low a point.

441 37 Q. Is that an indication also of a reduction in the supply or capacity of the well?

A. No; I would not take that as an indication of reduction in the supply. The practical method of taking care of any gas field is to keep everything out of the gas rock excepting the gas itself, and by keeping up a little head pressure and not decreasing the pressure and not allowing the pressure to go too low it keeps the rock full and keeps the pressure in that rock up to the point which will keep anything from entering the rock.

38 Q. What, in your judgment, is the occasion of pressure on a gas well?

A. That is a matter of theory. By some it is attributed as being caused by the weight of the rock above, and by others the weight of a column of fluid above the gas. We know that the rock pressure increases as the depth of the gas strata.

39 Q. Which do you think is the more plausible theory of the two—the rock pressure or the fluid pressure—the expansibility of the gas in contact with the rock?

A. I consider the weight of the column of fluid the most plausible.

40 Q. That, in fact, is the accepted theory among geologists, is it not, and also among men who are considered experts in the gas industry?

A. Well, that is the generally accepted theory.

41 Q. If that is true, does it not follow that where fluid is blown from a well that the supply or limit of the gas is near its close?

A. No; I would not take that for granted, and I would not accept that as a fact for this reason: By actual demonstration in the Eastern gas fields wells have been known to have been drowned by salt water and oil, and that salt water and oil has been pumped out and kept pumped out and the supply of gas has continued.

42 Q. What wells do you refer to?

A. I don't know the names of the wells particularly or individually, but this summer a party was going through this country who had quite a number of letters of recommendation from different manufacturing firms in Pennsylvania, where he had restored and increased the volume of wells in some cases where they had been drowned out. I was very busy at the time, and was just about going away, and didn't have the time to spend with him as I would have liked; but his letters and credentials showed that he had been successful in his plan of restoring or reviving those wells. I don't remember his name. He was at the office several times and wanted to do some business with us.

43 Q. Did you give him a chance to operate on the Karg?

A. No, sir.

44 Q. So far as your knowledge goes, a well in this locality that flows fluid—salt water or oil—is practically rendered useless for the purpose of supply, is it not?

A. If the fluid is allowed to increase or if the fluid is not kept out of the gas-bearing rock, of course the gas will not continue to flow from the well in the same quantities as it originally had *flown.*

45 Q. Practically, a well is useless, is it not, for the purpose of supplying gas for consumption?

A. Do you mean ultimately and finally?

46 Q. No; I mean during the time that it is in that condition.

A. No; I would not say it is useless. We have a method
442 of separating the fluid from the gas, in the case of wells that throw fluid, so as to keep the gas flow clear from the water.

47 Q. Have you tested that on any of your wells here?

A. Yes; we have in those wells that showed signs of salt water—on the salt-water belt—we have used those on those wells and kept the fluid free.

48 Q. How many of those have you in operation?

A. We have two of those in operation.

49 Q. How far from here are they?

A. A mile and a half southeast of Findlay.

50 Q. Are they in use now?

A. Yes, sir.

51 Q. They are two of the four that you are now using?

A. No; they are those wells that we have shut in.

52 Q. Then you are at present not using those wells with your separator attachment?

A. The separator attachment is a part of the connection to the well. We blow the wells off and test them for fluid from time to time and try to keep the fluid out of the well, whether it is in use or not.

53 Q. There has been some complaint from the consumers here, not only manufacturers but domestic consumers, has there not, with reference to the supply of gas here from the Findlay field of a reduction and insufficient supply, and also of fluid in the gas?

A. As far as my present connection with the plant is concerned, I have no complaints of that kind.

54 Q. Your present connection with the plant dates from——

A. From the third of June last.

55 Q. Since that time you have been drawing substantially from the Stewartsville field, haven't you?

A. Since the first of October we have been drawing substantially from the Stewartsville field.

56 Q. Haven't you been drawing since the first of June from the Stewartsville field?

A. No; we have just commenced to operate in the Stewartsville field this summer and our wells were being drilled there in July and August, and our pipe line has not been constructed until lately.

57 Q. You spoke of the city gas well that in 1884 gave a supply or production of two hundred and fifty thousand cubic feet per day.

A. That is the gas-works well.

58 Q. I mean the gas-works well—that is used to supply gas for the district school-house I understand?

A. Yes, sir.

59 Q. For how long has it been used for that purpose?

A. About two years.

60 Q. Is it entirely devoted to that use?

A. Not entirely.

61 Q. For what other use is it being drawn on?

A. The balance of the gas goes into the city line.

62 Q. I understand you that in order to supply the two hundred and fifty thousand cubic feet to-day the pressure has to be maintained at what—is that the open, full capacity?

A. That is the open, full pressure of the well.

63 Q. What is the usual sized pipe put into these gas wells?

A. Three-inch for an ordinary well—a well of from three to five million cubic feet capacity.

443 64 Q. Now, to supply two hundred and fifty cubic feet per day through that pipe, what pressure will be required or permitted through a three-inch pipe?

A. I couldn't say exactly without making an estimate or calculation. With an ordinary depth of well, the tubing or pipe it reaches the gas rock, being from ten to twelve hundred feet in length, a three-inch pipe would supply two hundred and fifty thousand cubic feet of gas at an open pressure of about one-fifth of a pound.

65 Q. Are there any other wells being drawn upon other than the eleven wells which you have mentioned—that is, the four that you are drawing upon now and the ones closed in?

A. Some of the manufacturers here have their own lines. There are several manufacturers use gas from their own wells which have been drilled and which are now in use.

66 Q. What, in your judgment, is the present consumption of natural gas for all purposes, within the city of Findlay, daily, for the purposes of domestic use, lighting, and manufacturing?

A. About thirty-five million feet per day.

67 Q. About how many miles of pipe have you within the city limits?

A. That I could not state exactly.

68 Q. About how many?

A. Within the city limits there are twenty-five to thirty miles.

69 Q. What is the size of your main pipe, low pressure and high pressure?

A. We have an eight-inch high-pressure circuit line around the town, which is fed into the low-pressure pipe, eight inches.

70 Q. What is the pressure upon your high-pressure main in the city?

A. The pressure upon the high-pressure circuit line is from forty to fifty pounds.

71 Q. And upon your low-pressure circuit?

A. On our low-pressure lines the pressure is about twelve ounces.

72 Q. With a pressure at the well, thirty-six miles from Toledo, of, say, two hundred pounds to the square inch, gas flowing through a twelve-inch main, at what pressure would the gas flow through the pipe open at Toledo?

A. There would be at least fifty to seventy-five pounds at the Toledo end of the line.

73 Q. Practically, I take it, it would be necessary to maintain a

pressure at about two hundred pounds at the wells through a pipe of that size at that distance to maintain a pressure of fifty to seventy-five pounds at the Toledo end of the line?

A. Yes, sir.

74 Q. The city of Findlay, as I understand, is operating its gas territory and the supplying of gas under legislation similar to that under which Toledo proposes to operate and supply gas, as I understand it?

A. They are supplying gas—in the natural-gas business—by enactment of the Legislature, which I presume is the same.

75 Q. What is the bonded debt of Findlay for its gas investment, in round numbers?

A. In round numbers, about three hundred thousand dollars—that is, the gas plant. I had the exact figures, but I have not got them now.

444 76 Q. Does that include its total investment for territory and pipes?

A. That includes the total bonded indebtedness, which was the question asked.

77 Q. Does that bonded indebtedness cover the total indebtedness of the city for its gas investment in full?

A. Yes, sir.

78 Q. What in round numbers is the gross income from the investment?

A. At the present consumption the gross income will be from eighty-five to ninety thousand dollars per year.

79 Q. What is the gross expenditure per annum?

A. About thirty-five thousand dollars per year.

80 Q. Outlay?

A. Yes, sir.

81 Q. Does that include the interest on the bonds?

A. That does not include the interest on the bonds.

82 Q. What is the rate of interest your bonds are drawing?

A. Part of them five and part of them six per cent.

83 Q. Your last issue is six per cent.?

A. Yes; I think so.

84 Q. Have they all been negotiated?

A. Yes, sir.

85 Q. And your bonds mature in what time?

A. Part of them mature from '91 on up.

86 Q. Through how many years?

A. Part of them in five and part of them in ten.

87 Q. And your estimate on the gross income and expenditure is based on your knowledge of the running and operation of the industry since June, 1889?

A. Since June, 1889; not prior to that time.

88 Q. Your estimate is based on your knowledge of the condition of things since then?

A. Yes, sir.

89 Q. When was the electric-light plant put in here (Findlay)?

A. That I don't know positively.

90 Q. About how long ago?

A. To the best of my recollection, it was a little over a year ago.

91 Q. To what extent is that used for the lighting of streets, if at all?

A. I am not conversant enough with the lighting of the streets to state positively, but the bulk of the town—that is to say, at least sixty per cent. of the town—is lighted by electricity.

92 Q. Is it used to a considerable extent in private houses and stores?

A. It is used to considerable extent in business, but there is very little of it used for domestic lighting.

Re-examination:

1 Q. I don't know but you have already stated, but I will ask you again, how near to its full capacity a well ought to be run to get the best service from it.

A. To get the best service from a well and to protect the well it should not be used at a less pressure than two hundred pounds, or, in other words, its pressure should not be drawn upon so as to lessen the pressure below 200 pounds.

445 2 Q. And what is the object of keeping that back pressure?

A. To keep the rock free and clear of any substance or fluid that would be apt to clog it up and prevent the gas from coming through it freely.

3 Q. What, according to your judgment, is the cause of salt water coming into the wells in this territory where it has got into them?

A. The reduction of the rock pressure below one hundred pounds has been the cause of fluid getting into the wells in this field. It is not desirable to let the pressure go below two hundred pounds, as a maximum, in any gas field. Below one hundred pounds pressure the fluid is apt to get into the well or into the gas-bearing rock.

4 Q. How does this back pressure keep the fluid out?

A. By reason of the back pressure itself, owing to the pressure in the gas rock being more than the pressure of the fluid surrounding it or near to it.

5 Q. What is the effect of the water getting into the Trenton, in the way of stopping up the rock or anything of that kind?

A. The effect of fluid getting into the gas-bearing rock would be to fill the area or the space formerly occupied by the gas, and in this manner keeping the gas from coming into the rock from whatever source or fountain-head it may have.

6 Q. Is there such a thing as paraffine getting into the pores of the rock?

A. Yes; we frequently find that the rock will paraffine shut.

7 Q. What brings that in?

A. That is a product or chemical constituent of the oil.

8 Q. That is brought in by the oil?

A. Yes, sir.

9 Q. State whether or not that has a tendency to stop up the pores and prevent the gas passing through?

A. Yes; that has a tendency to a considerable extent—in fact, it it will stop it up entirely.

10 Q. What is the fact about there being instances where a well has *flown* both salt water and gas, in quantities, almost immediately after being opened? I don't mean in this place, but in any field that you know of.

A. In some parts of the field in the developments of the drill, or in drilling a well, we get to the gas-bearing rock and secure a flow of gas, and then, by deeper drilling or by continuing to drill on the wells, they strike salt water and oil below the gas, properly speaking, but very close to it; so much so that in the drilling in of a well it is necessary to exercise a great deal of caution, after you think you have the bulk of the gas, as to how deep you shall go.

11 Q. In such a case as that, if the well is left wide open, how long would it take this gas and oil to come up?

A. It will come up at once.

12 Q. Will that indicate the absence of gas or the exhaustion of the gas in the gas-bearing rock?

A. No, sir.

13 Q. Should you say, in your opinion, there may be a flow of fluid from a gas well or a well that has been bearing gas without indicating any exhaustion of the gas in the gas-bearing rock tributary to that well?

A. It is by no means a sign that in finding oil or salt water coming in with the gas that the field is in a state of exhaustion.

446 14 Q. Is it a sign where a well has been bearing gas for some time and been running wide open and oil or salt water gets in—is it then a sign that the gas in the gas-bearing rock tributary to that well has been exhausted?

A. No.

15 Q. Then by properly handling a well in the way of keeping back the pressure upon it what effect will that have, in your judgment, upon the life of the well?

A. It will prolong the life of the well materially.

16 Q. What has been the fact as to the way the Karg well here had been used along at first?

A. The Karg well has been terribly abused.

17 Q. In what respect?

A. Of course, it being the largest well in this portion of the gas field at that time, it attracted a great deal of attention, and excursion after excursion came to Findlay to see the large well, and it was being turned on constantly for that purpose.

18 Q. What are your charges here for gas for domestic consumption?

A. One dollar a stove, net.

19 Q. Is that the year around?

A. That is the year around—the net price.

20 Q. What are your charges to the factories?

A. The charges to the factories are merely nominal. The actual charge for using gas for manufacturing purposes runs from three hundred to six hundred dollars a year per factory.

21 Q. You mean by that that your charges to the factories, to all that use gas, run from three hundred to six hundred dollars for each factory?

A. Yes; it varies with the kind of factory.

22 Q. You charge no more than six hundred nor less than three hundred?

A. Some of the small factories not coming under the head of factories are less than that, but not material enough to call it anything.

23 Q. What proportion of the gas consumed in Findlay is consumed by the factories of various kinds?

A. About one-half of it.

24 Q. What are your charges here for furnaces?

A. In hot-air furnaces for private houses from one dollar to four dollars a month.

Also JOHN WOLFE, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. KINNEY:

1 Q. You may state your age, place of residence, and occupation.

A. Twenty-eight; residence, east of Findlay, four miles; at this time I am interested in the gas business.

2 Q. In what way are you interested in the gas business?

A. I am helping the Kenton people in getting their pipe line through and am interested in the Kenton line.

3 Q. How long have you been interested in the gas business?

A. About two years.

4 Q. What have you been doing during that time?

A. Leasing land.

5 Q. I will ask you to state whether or not you know whether Kenton is constructing a natural-gas line.

A. They are.

6 Q. Where from?

A. From the Marion township, about three and three-quarters miles northeast of Findlay.

447 7 Q. How near where you live?

A. It is right in that neighborhood.

8 Q. Do you know how far this is from Kenton?

A. About thirty-three miles; at least that is the length of their pipe line.

9 Q. Do you know who is constructing that line?

A. It is owned by a private corporation or a private company.

10 Q. What is the name of the company?

A. The Sciota Natural Gas Company.

11 Q. Do you know who are the principal stockholders?

A. I think that the principal stockholder is Thomas Espy.

12 Q. Where does he live?

A. At Kenton.

13 Q. Are all the stockholders Kenton men?

A. Yes, sir.

14 Q. Do you know whether or not they are business men there in Kenton?

A. They are.

15 Q. What is the size of that line they are constructing?

A. Six-inch.

16 Q. Do you know what the size of Kenton is—that is, its population?

A. About five thousand.

17 Q. Is the six-inch line large enough, in your judgment, to furnish gas from this field to Kenton?

A. It is.

18 Q. Do you know anything about the Carey, Ohio, line?

A. Yes, sir.

19 Q. Where are they getting their gas?

A. They are getting their gas from the Marion township field.

20 Q. Do you know what the size of their line is?

A. It commences with a four-inch, and I think they have about five miles of five-inch.

21 Q. When was that line constructed, if you know?

A. About three months ago; completed about three months ago.

22 Q. How long have you been acquainted with the Northwestern Ohio natural-gas field?

A. For—well, ever since it was found.

23 Q. What, if any, have been the extensions of the field within the last two years, say, if you know?

A. Well, the field is larger than it was supposed to be, by developments within the last four months.

24 Q. Where were those developments made?

A. West of Stewartsville and at Arcadia.

25 Q. How far west is that?

A. About three-quarters of a mile west of Stewartsville.

26 Q. What have they discovered there in the way of gas wells?

A. Very good wells. Mr. Harris drilled in a well on the McTrout farm, which was about a four-and-a-half-million well naturally.

27 Q. What do you mean by "naturally"?

A. Without being shot.

28 Q. What would you say as to the chances or the probabilities of a further extension of the gas field beyond its present limits?

A. I think there is a very good chance for new territory to be opened up, and that will be paying territory.

29 Q. In what direction would you say?

A. I would say east.

30 Q. Have you ever had any experience in constructing lines?

A. No, sir.

448 Cross-examination by Mr. POTTER:

1 Q. Have you experience and knowledge—information—as to the duration of wells where their full capacity is drawn upon from the time of their being drilled in?

A. I would rather not answer that.

2 Q. Why?

A. Well, my reasons for its answer would probably answer it.

3 Q. Have you experience, knowledge, and information as to the duration of wells where their *where their* full capacity is drawn from the time of their being drilled in?

A. In the Findlay field I have—that is, in Findlay township.

4 Q. What have you found the duration of a well so tested to be?

A. I would like to have you state that a little plainer.

5 Q. You say in the Findlay field you have knowledge of the duration or probable duration of a well tested to its full capacity from the time it is drilled in. What is the life of such a well, within your knowledge and observation?

A. Some of the wells close to the edge of the gas field have been of short life, but I think due to salt water.

6 Q. When you say "short life" what duration of life do you put?

A. Three years.

7 Q. What does the presence of salt water or fluid in a well indicate in regard to the supply or quantity or resources of the well and supply of gas?

A. It is my opinion that it would shorten the life of a well. In some cases I have known it to shut off the supply entirely, while in other cases—as in the case of the Doty well, southeast of Findlay—they still continue to use gas from that well, and there is a steady stream of salt water almost as thick as a man's wrist flowing from the well all the time.

8 Q. Is it practicable to use a well in such a condition as that?

A. Well, at this time the city of Kenton or the Kenton Gas Company are collecting about twenty-three hundred dollars a month from that little salt-water well—at Toledo prices.

9 Q. The life of other wells in the Findlay district—what have you found those to be?

A. Outside of the edge of the territory—I consider Findlay township the edge of the territory—I find that the life of the wells are not so long; salt water has hurt the wells here; they have been badly treated, while in the center of the field I don't think there is any falling off to speak of. For instance, the city of Tiffin—the Tiffin Natural Gas Company has been supplying Tiffin from three wells. They have had three wells connected up and only two have been used—the Underwood and the Blair—and I don't think there has been any falling off, and they have been used, I would say, over two years.

10 Q. Do you know, of your own knowledge, what the pressure is on those wells now as compared with the original pressure two years ago?

A. That is something I would rather not answer. I can tell you the pressure when the wells were drilled in.

11 Q. State that if you will.

A. Four hundred and forty-five (445).

12 Q. That is the rock pressure?

A. Yes, sir; the rock pressure.

449 13 Q. Do you know what the rock pressure of those same wells is now?

A. I would rather not answer that, Mr. Potter. I will say this: I think the rock pressure from them wells—they will show more rock pressure than the wells at Stewartsville.

14 Q. How recently did you know their rock pressure?

A. Of a well that I am interested in north of these wells—I can tell you the rock pressure of that well, but it has not been used.

15 Q. I am inquiring after it has been used for the last two years.

A. That I would rather not answer.

16 Q. Do you know the rock pressure on the wells at Stewartsville when they were drilled in? What was it, about?

A. In a well at Stewartsville—Toledo's well—on the John R. Ware tract, their rock pressure was from 373 to 378.

17 Q. Have they been drawn upon or used at all?

A. No, sir.

18 Q. And the wells at Stewartsville that are now being used or drawn upon by the city of Findlay, do you know what their rock pressure was at the time they were drilled in?

A. No; I don't think they took the rock pressure of any well out there except the Wineland well, which is owned by the city of Findlay, three miles east of Findlay, near the Nickel Plate road.

19 Q. I would be glad to have you answer the question as to what is the present rock pressure of the two Tiffin wells that you have mentioned.

A. I have just refused to answer that question.

Mr. POTTER (to Mr. Kinney): I shall move to rule out the entire deposition unless an answer is made to the interrogatory.

Mr. KINNEY: That is just the question I want him to answer.

WITNESS: I have stated this to you: that I know that it is greater than the rock pressure at Stewartsville, and have reasons to know that it is.

Mr. POTTER:

20 Q. You are familiar with the history of the Karg well, are you?

A. Yes, sir.

21 Q. What was the original rock pressure on that well?

A. I think the original rock pressure of the Karg was four hundred and fifty (450), but I have no reason to know that it was.

22 Q. Do you know what the present rock pressure of the Karg well is, substantially?

A. I do not.

23 Q. How long has the Karg well been in existence?

A. I suppose you gentlemen could answer that better than I could.

24 Q. Do you know about when it was drilled in?

A. Yes, sir; I ought to know. I don't believe I would care to answer that, because I don't recollect.

25 Q. Do you know about how long?

A. I don't believe you would need that high a pressure.

47 Q. What pressure would that give you at the other end of the line, in your judgment, through that diameter of pipe?

A. About sixty-five pounds.

Re-examination:

1 Q. What is the extent of the present known gas field of Northwestern Ohio—its length and breadth in miles?

A. The territory extends about twelve miles north and south—between ten and twelve—and I would say that it would average five miles east and west.

2 Q. If you know, what proportion of that territory is being drawn on now by consumers?

A. A very small amount of it.

3 Q. Can you give us any ratio?

A. No; I can't, for this reason: No one can tell how far a well will draw. The south part of it is being drawn on, and the west side of the territory and the north side; the centre is not drawn on nor the east side.

4 Q. I understood you, in your cross-examination, to say that, in your opinion, a well of ten millions capacity, located in the
452 best gas territory of this section, drawn on to its full capacity, would exhaust in five years.

A. That is my opinion.

5 Q. What do you base that opinion on—from practical experience or simply your theory?

A. It is simply a theory.

6 Q. You have no facts to base it on?

A. No, sir.

The further taking of depositions herein is adjourned to Toledo, Ohio, Wednesday, November 27th, 1889.

WEDNESDAY, *November 27th*, 1889.

Met and adjourned, by consent, to Friday, November 29, 1889.

FRIDAY, *November 29th*, 1889.

Met and proceeded with the taking of testimony herein at the office of Brown & Geddes.

Present, representing complainants: E. D. Potter, Jr., Esq.
" representing defendants: Clarence Brown, Esq.

JOHN J. OWENS, of lawful age, being first duly sworn, testified and deposed as follows:

Direct examination by Mr. BROWN:

1 Q. You may state your name, age, residence, and occupation.

A. John J. Owens; age, thirty-four; residence, Wisconsin street, Toledo, Ohio; occupation, natural-gas inspector.

2 Q. You are one of the officers of the city of Toledo, are you?

A. Yes, sir.

3 Q. How long have you occupied the position of natural-gas inspector in the city of Toledo?

A. I commenced to work two years ago last July.

4 Q. Were you the first person appointed to that position after the office was created?

A. Yes, sir.

5 Q. In the performance of your duties as natural-gas inspector have you inspected or had inspected under your direction all of the connections that have been made by the present gas companies of the city of Toledo?

A. All that I had reports to go to.

6 Q. By the ordinance, I believe, the gas is not to be turned on until inspected.

A. Yes, sir.

7 Q. Have you inspected or caused to be inspected under your direction all of the connections that have been made since the gas companies came here and gas has been turned on?

A. Yes, sir.

8 Q. When was the first inspection made?

A. Well, it was—they started to pipe houses in the latter end of July. I don't know just exactly the date, but I have a report of this; it was in the latter part of July, 1887.

9 Q. Have you kept records of all the inspections made during that time?

A. Yes, sir; I have got a record of every building we have tested with the pipes in.

10 Q. You may state, if you can, approximately how many consumers there are of natural gas in the city of Toledo at the present time of all classes.

453 A. That is pretty hard to get at. The way I would get at it, I would average the number of jobs we had inspected each day.

11 Q. Give the figures and tell how you arrived at it.

A. Say the first year, from the number of new jobs all the way through, we have averaged—there have been two men on steady all along with the exception of the first two or three months of the year 1887. Take four months in the year, say September, October, November, and December, the last four months in the year; say we would go to as high as fifty houses a day. I go to that many and the other man goes to that many, and out of that fifty maybe each of us would get forty jobs that will be all right. Those are not new jobs. They are reinspections where some people move out and others move in again.

12 Q. What proportion of the work for this year, say, would be new jobs?

A. For four months I would say fifty new houses—fifty new jobs. The first year say fifty, and then I would come down and say maybe the next year forty, and this year thirty—that is, for four months in the year.

13 Q. Then, as I understand you, the great bulk of the connections are made in the latter part of the year?

A. Yes, sir.

14 Q. And for the first year you say they would average fifty a day to two inspectors?

A. Yes, sir; that would be twenty-five apiece, fifty between us.

15 Q. I am speaking of the entire number.

A. That would be fifty.

16 Q. During the last four months of 1887, of the first year, you say they would average in new work fifty a day for two inspectors?

A. Yes, sir.

17 Q. How many days to the month?

A. Twenty-six working days to the month.

18 Q. Then that would be, as I understand it, fifty times twenty-six or thirteen hundred per month for the first year?

A. Yes, sir; it figures up in that way. I would get twenty-five a day and the other man would get twenty-five a day.

19 Q. That would be thirteen hundred a month for four months?

A. Yes, sir; and for four months it would be four times thirteen hundred.

20 Q. That would be fifty-two hundred for the first year?

A. Yes, sir.

21 Q. Now, the second year how many would you average per day of new work?

A. I would drop off, say, to forty.

22 Q. Was that because you did less work the next year or because of renewals and changes?

A. Changes and people moving out. It would average about forty the second year, because there were not as many men working as there was the first year.

23 Q. And that for twenty-six days would be forty times twenty-six—ten hundred and forty to the month?

A. Yes, sir.

24 Q. And for four months it would be forty-one hundred and sixty?

A. Yes.

25 Q. Would that be for additional connections made besides those made for the preceding year?

A. Yes, sir; new work I am speaking of; averaging that for new work, not speaking of changes and families moving out.

26 Q. For the third year what would it average?

A. I would drop off to thirty for new work.

454 27 Q. Thirty for twenty-six days would be seven hundred and eighty per month?

A. Yes, sir.

28 Q. And for four months, thirty-one hundred and twenty for the year?

A. Yes.

29 Q. You figure for four months. Do you mean to say by that that you do no work in the balance of the year?

A. Oh, yes. I am just merely judging by the jobs that I have been on that it would average that way.

30 Q. You make this average for four months, and that would represent fairly all of the new work done in the year, would it?

A. Yes, sir. I am satisfied that I am not going above the number of houses. I am just averaging that way, so as to be inside of the limit.

31 Q. How many mixers would these connections average to each consumer?

A. Including private residences, factories, and everything?

32 Q. Including everything you have made, just as you included everything before. How many mixers would be included in each connection made, including every consumer, if you can?

A. The way I would figure that it would average about three No. 5 mixers to every consumer.

33 Q. And by each consumer you mean each new connection that you have spoken of?

A. Yes, sir. That is three No. 5's for each job that we have inspected. I wouldn't want to include the rolling mills nor the glass works in that—that is, factories where they have got one or two boilers and private houses and school buildings and churches. They would average about three No. 5's.

34 Q. And you except from that the glass works and the rolling mills?

A. I would place it at that without including them into it.

35 Q. Are there mixers placed there, or are they paying upon the basis of mixers at all?

A. No. At the rolling mill they pay for what iron is turned out. There is a man works for the gas company, and he keeps track of the number of pounds of iron turned out.

36 Q. In the glass works how is it?

A. I don't know how they do there, but I think something similar to the other.

37 Q. They have no mixers there?

A. No, sir.

38 Q. Do you know the amount that is paid by the rolling mill and by the glass works?

A. No, sir; I don't know.

39 Q. Do you know whether these two concerns are large consumers of gas?

A. Yes, sir; they are.

40 Q. How do they compare with the consumers in the city? Are they large or small?

A. I should judge, from the amount of gas—I have been there—there are high-pressure lines there, and I judge, from the way the gas goes through those high-pressure lines, the regulator, and into the pots at the glass works, that there is a good deal of gas there. I don't know how many mixers it would take.

41 Q. Are those two concerns among the largest consumers in the city?

A. Yes, sir. The asylum is not included, and that ain't in the city, I don't believe.

42 Q. Do you know how much the rolling mill pays per ton?

A. No, sir.

455 43 Q. Did you inspect the water-works connection?

A. No, sir; I didn't; the other man did. My work is on this side of Jefferson street.

44 Q. The other man you speak of is your assistant?

A. Yes, sir.

45 Q. Are you familiar with the water works and the gas works up there?

A. I have worked on them boilers. I knew the number of boilers—did know. I remember of seeing them.

46 Q. You know of them generally?

A. Yes, sir.

47 Q. How many factories and manufacturing establishments are there that have the same number of boilers and consume about the same quantity of gas as the water works?

A. The water works is quite a large concern—the water works, I should judge, uses as much gas, maybe, as one of the glass works—from the number of boilers they have got there. They work night and day at the water works and the glass works don't.

48 Q. Do you know how many establishments there are, approximately, of that size and consume that much gas?

A. No; I don't.

49 Q. Do you know anything about the brick yards, whether they use gas?

A. Yes, sir.

50 Q. How are they, large or small consumers?

A. They use gas a couple of months in the year, maybe.

51 Q. Would you say that these estimates that you have given of the number of consumers and the average number of mixers was a fair estimate, according to the best of your information from your records?

A. Yes, sir; I am satisfied it is within—of course, I am getting at it as near as I can, but I am satisfied that my average is under—that is, I am inside of the number of mixers there is on, according to my judgment and belief.

52 Q. How generally is gas used along the line of the streets where natural-gas pipes are laid?

A. Do you mean the consumers using gas?

53 Q. Yes; how generally is it being used where it can be used?

A. Wherever the lines is run on the streets there are, I should judge, now, at the present time—I don't believe there is an average of three out of ten that ain't using it—that is, seven out of ten is using it, on the average, judging from those where the lines are on the streets.

Cross-examination by Mr. POTTER:

1 Q. You began your service as inspector in 1887?

A. Two years ago last July.

2 Q. And you have performed service as inspector ever since?

A. Yes, sir.

3 Q. In your employment of gas inspector do you keep a record of the buildings and localities—of the numbers and localities—where this inspection is made?

A. We keep a memorandum, in books, of every job we go on.

4 Q. So that every inspection you have made yourself within the last two years and up to this time you have a memorandum and a record of?

A. Yes, sir.

5 Q. And your associate also, I suppose, as a part of his duty, kept a record of each inspection?

A. Yes, sir.

456 6 Q. For instance, if you would go into a house where they had two furnaces, five grates, and a kitchen range, what would your record show? Would it show the number of furnaces?

A. The number of furnaces and the number of mixers, if the mixers are on. If there is three I mark down on the book three openings of whatever size the openings are.

7 Q. Did you take the numbers of the mixers—for instance, if they are No. 3 or No. 5?

A. Yes, sir.

8 Q. So that in your inspection you took not only the number of mixers as to the amount of mixers, but also the numbers of the mixers as to their gauge?

A. No, sir; I didn't have nothing to do with the gauge of the mixers.

9 Q. You took the number of the openings?

A. Yes, sir; there is no mixers put on the job until I pronounce the job all right, and they go on afterwards and put on the mixers.

10 Q. It shows the openings for the mixers?

A. Yes, sir.

11 Q. And from the time that you began your duties, as I understand you, you have pursued the same custom and the same rule as when you first entered the service?

A. Yes, sir.

12 Q. Did you make a report of these inspections to anybody?

A. No, sir.

13 Q. Under whose directions did you act?

A. Under the city solicitor's orders—that is, when I wanted any information in regard to it. It is by the order of the council—that is, under their orders.

14 Q. Your service as inspector lasts from what time to what time in a day?

A. From seven in the morning until twelve, and then from one to six. It averages that, but I have worked as high as eleven o'clock at night, and worked Sundays, too, in busy times. Take it in factories where they couldn't shut down, and would go there and test it some Sunday—the glass works and the rolling mills.

15 Q. What inspection of the piping for natural gas is there made? What do you do?

A. I got to the building——

16 Q. Is there anybody with you?

A. Yes; I have a man along who works for the gas company. They furnish a man, with tools, pump, and gauge. I look to see if the pipes are all right, and then I put on the gauge and pump air into it and test it.

17 Q. Do you go over the pipes to see if the pipes are all right?

A. So far as I can see.

18 Q. Where it is exposed?

A. Yes, sir. If it is in a house where there is a cellar I put on the gauge there, and then I go through and take the number of the grates or whatever there is and mark it on the book.

19 Q. In inspecting a house with two furnaces in the cellar and six grates and a kitchen range, about what length of time would be consumed in the inspection?

A. Oh, five minutes.

20 Q. Could you inspect a house with that service in five minutes to your satisfaction?

A. Yes; that is as long as I leave the gauge on or longer. Where there is only one fire I don't leave the gauge on maybe more
457 than two minutes. When I first started out I used to leave it on ten or fifteen minutes, until I got accustomed to the gauge.

21 Q. If you find a leak in the job, then what?

A. I mark it on slips which I have, and mark it "leaks" and the time in the morning.

22 Q. Then you inform the gas company?

A. Yes.

23 Q. Do you stop to find out where the leak is?

A. No, sir.

24 Q. Then they repair the pipes and then you reinspect it?

A. Yes, sir.

25 Q. How frequently do you find leaks in houses, say in fifty houses?

A. In fifty houses some days there would be five or six leaks.

26 Q. Sometimes more and sometimes less?

A. Yes; there wouldn't be a day but there would be two or three, anyway—that is, for the first two years. There ain't so many now, because they are accustomed to do their work right.

27 Q. Your estimate for the first year would be fifty separate new inspections a day for the last four months of the first year?

A. Yes, sir; for the four months—that is, for the year, averaging it in that way.

28 Q. Have you made any computation on your books or from an examination of your books with reference to ascertaining substantially or accurately the number of inspections that you made for the first year?

A. No, sir; I have not.

29 Q. Have you made it for the second year?

A. No, sir.

30 Q. Or have you made it for this last year?

A. No, sir; I have merely given the average.

31 Q. You are kind of guessing at it, I suppose, somewhat?

A. I will guess what I think is right.

32 Q. You haven't set down and made any computation as to the actual number?

A. No, sir; neither one way or the other.

33 Q. You are simply giving it as you judge, from recollection of what you did do?

A. Yes, sir.

34 Q. In stating that on the average there would be three number five mixers to an inspection, is that what you mean?

A. There — number five mixers to each house; it would average.

35 Q. How would you class the Boody House; is that one house?

A. I would class it as one house.

36 Q. On the general average, you assign to that three number five mixers?

A. Yes, sir.

37 Q. Can you state what proportion of the inspection that you made would be one number five?

A. I suppose a great many. That is the reason I classify it in that way. In small houses there is but one.

38 Q. Have you made any computation from your books as to your accuracy on that?

A. No, sir; I have not.

39 Q. Have you made any computation or examinatiou of your records or books to ascertain so you could speak with reasonable certainty as to the number or proportion of houses that have simply one number five mixer?

A. No, sir.

458 51 Q. Or as to how many had two number five mixers?

A. No, sir.

52 Q. I suppose the same answer would be with reference to the three number five mixers?

A. Yes, sir.

53 Q. I suppose your records for the last year would show exactly how many inspections you yourself made?

A. Yes, sir.

54 Q. And how many houses and how many mixers in each house, wouldn't they?

A. You couldn't get that from the books very well, because we have been half a dozen times to one house, where one family moved out and another one moved in, but I don't include that.

55 Q. You keep a record of that, too, do you?

A. Yes, sir; every time I go to a house, if it is only to put a mixer on a grate.

56 Q. If you go into a house to inspect it the first time to-day, there is a record made of that inspection?

A. Yes, sir.

57 Q. On your books? And say four months afterwards you go in and make another inspection, do you make a new inspection— have you any reference in making the new inspection to the first inspection? You have a record of the first inspection. Suppose you make an inspection of the same place four months afterwards?

A. I don't test the pipe. I go there and report whatever it is—"one No. 5 mixer," for instance; there is quite a number of mixers. I record it as "one grate" or "one furnace," with such and such openings.

58 Q. Do you locate the mixers again?

A. I take the number of the building, whatever it is, the corner or the street, and the occupants.

Re-examination:

1 Q. In estimating new work I understand you have not included any of these reinspections, have you?

A. No, sir.

2 Q. In saying that for the present year, for instance, that it would average thirty inspections for new work, that does not include any reinspections?

A. No, sir; it does not.

3 Q. During the present year how many inspections altogether, new and old, would you and your assistant make, on the average, each day?

A. I turned in as high as fifty last week. Some days it would be forty, when there was good dry weather. I turned in fifty-one one day.

4 Q. What proportion would be for entirely new work?

A. Fifteen.

5 Q. Then, for the two, it would be thirty?

A. Yes, sir.

6 Q. And that is the way you make up the average?

A. Yes, sir; I figure fifteen new jobs out of the fifty that I turned in and the other man turned in the same number. Last year I had at two or three different times five and six men for a day or two inspecting.

7 Q. When there was a rush you had to have additional assistance?

A. Yes, sir; I didn't have them but only for a couple of days.

Recross-examination:

1 Q. Have you your record book of inspection for the month
459 of December, 1888—November and December, 1888?

A. Yes, sir.

2 Q. That will show exactly the number of new inspections in those months made by you?

A. You would have to take your chances of picking them out. In the way wo enter them down, we enter the occupants and the number of the house and the street, and mark what they have got, "one heater," say, and for each opening.

3 Q. Have you your inspection books for November, 1889, with you?

A. Yes, sir.

4 Q. Can you tell from the past month how many new inspections you have made?

A. I can't tell exactly, but I can tell very near it—how many new jobs.

5 Q. Could you do it without much trouble—the number of new inspections that you yourself have made within the last month?

A. No, I cannot, because I never had any returns to keep any record of—only keeping the job as I went along. I have got a record of the time I started.

6 Q. Could you tell by reference to your book, for October?

A. Nothing more than I could in November.

7 Q. How would it be as to September? Have you got that book?

A. Yes.

8 Q. Could you tell how many new connections you have made in September?

A. No, sir; because I didn't mark them down "new" or "old." If I marked it now it would be a new job, but I make no distinction.

9 Q. And, in order to get at that, you would have to go to work and sift it all out in order to ascertain what was new work and what was old?

A. Yes, sir; It would be pretty hard to get at in that way and find out the number of new or old jobs.

Defendants offer in evidence the report of the president, secretary, and treasurer of the Toledo Natural Gas Company to the stockholders of said company, submitted on January 15th, 1889, and by agreement of counsel the same may be read in evidence from a newspaper copy thereof attached hereto and marked Exhibit No. 4.

Defendants also offer in evidence the returns of the Toledo Natural Gas Company and of the Northwestern Ohio Natural Gas Company made to the auditor of Lucas county, Ohio, dated respectively June 9th, 1888, and June 16th, 1888, so much thereof as relates to the city of Toledo, and by consent of counsel a printed copy of said reports, hereto attached, marked Exhibit No. 5, may be read in evidence.

It is admitted by counsel that all of the property included in the report of the Northwestern Natural Gas Company is within the city of Toledo, although stated to be in Lucas county.

Defendants also offer in evidence a certified copy of the record of proceedings in the case of Charles F. Curtis and others against the city of Toledo and others, in the court of common pleas of Lucas county, Ohio, which is filed herewith, marked Exhibit No. 6.

460 THOMAS H. TRACY, of lawful age, being first duly sworn, deposes and says:

Direct examination by Mr. BROWN:

1 Q. You may state your name, age, residence, and occupation.

A. Thomas H. Tracy; thirty years of age; occupation, attorney, and am at present one of the gas trustees of the city of Toledo; reside in Toledo, Ohio.

2 Q. As one of the natural-gas trustees of the city of Toledo you

may state if you know the number and capacity of the natural-gas wells at present owned by the city of Toledo.

A. I know the number. There are at present twenty-three wells owned by the city, and I have personally assisted in the measurement of eighteen of them. Of those eighteen I know the capacity.

3 Q. Will you state the capacity of the wells which you yourself have measured or participated in the measuring—their aggregate capacity?

A. It is something over one hundred and twenty-eight million (128,000,000) cubic feet of gas daily output.

4 Q. By "daily" you mean twenty-four hours?

A. Every twenty-four hours; yes, sir.

5 Q. In what field are these wells located that are owned by the city of Toledo?

A. With the exception of one they are in what is known as the Stewartsville field, and that one located in Bloom township.

6 Q. And what is the average distance of these wells from the corporate limits of the city of Toledo?

A. I take it the average distance would be the Nickel Plate crossing, and that would be about thirty-six miles.

7 Q. State if you know what is the reported capacity of the remaining five wells not measured by you.

A. The aggregate reported capacity, as reported by our engineer, is seventeen million cubic feet—of those five which I have not personally assisted in measuring.

(Answer objected to — complainants' counsel so far as it involved hearsay.)

8 Q. Is this information from the official reports of the board?

A. Yes, sir.

Cross-examination by Mr. POTTER:

1 Q. One of these twenty-three wells is in Bloom township, Wood county?

A. Yes, sir.

2 Q. How far is that from here?

A. That would be about—from the corporate limits about twenty-eight miles.

3 Q. What is the capacity of that well?

A. That I only know from the report of the engineer. That is reported as a small well—five hundred thousand cubic feet.

4 Q. Have you any knowledge of it yourself?

A. No, sir.

5 Q. The other wells are located in what is called the Stewartsville field, five or six miles north of Findlay?

A. Yes, sir.

6 Q. The nearest one being how near to Findlay?

A. If you take the corporate limits of Findlay the nearest one, I think, is within a mile and a half.

7 Q. Take it from the court-house in Findlay.

A. Four and a half or five miles.

461 8 Q. That would be about how far from the city of Toledo?

A. Thirty-seven and a half or thirty-eight miles.

9 Q. Then the next well is located where?

A. There are three other wells located within a short distance from that one which you have just mentioned.

10 Q. How close to each other?

A. I should say there they range from eighty rods to a half a mile distance from each other.

11 Q. And the twenty-two wells lie within a radius of what, with reference to each other—how far are the farthest ones apart?

A. I should say they were about seven miles—seven or eight miles—north and south.

12 Q. Do you include Bloom township?

A. Yes, sir; seven or eight miles north and south and a mile and a half or two miles east and west.

13 Q. The city's interests or property rights, what are they? Are they the owners of the fee or part owners of the fee and part of them gas rights or leases of the territory?

A. Well, some of the property is owned in fee and some of it we have a perpetual gas right on, and some—a very small amount of it—we have on annual rental—a perpetual lease, but an annual rental.

14 Q. How much territory in gross does the city own in fee or have the gas right to?

A. In the neighborhood of seven hundred acres.

15 Q. About how much in fee?

A. I couldn't state that definitely.

16 Q. About how much?

A. They have not a large amount in fee. That is confined principally to small locations, town lots, small locations.

17 Q. Is this property which the city owns or controls continuous and contiguous property—territory—or is it territory separated into pieces and patches here and there?

A. Well, it is not all connected, of course.

18 Q. Your wells down there are numbered from "1" to "22" in the Stewartsville field?

A. Yes; from "1" to "23." Our engineer has given them arbitrary numbers.

19 Q. Do you know where the numbers are located?

A. I think I can locate the most of them.

20 Q. Where is number one located?

A. No. 1 is the one you asked me about first as being nearest to Findlay.

21 Q. Is that located on a lot?

A. No, sir; it is located on a tract of some one hundred and fifteen acres, I think, we have in that.

22 Q. Is there more than one well upon the tract?

A. That is upon an eighty-acre tract.

23 Q. Are there any other wells on the eighty-acre tract?

A. Yes, sir; there are two other wells upon that tract.

24 Q. Do you know what the rock pressure of those wells are?

A. Yes, sir.

25 Q. What are they?

A. I knew at the time they were measured, at least. The rock pressure of those wells at the time they were measured was ranging from three seventy-three to three hundred and seventy-eight pounds.

26 Q. That is, the two?

A. That is, the three on that eighty-acre tract.

462 27 Q. Including the city well No. 1, are those two other wells owned by the Findlay people?

A. No, sir; they are all three owned by the city of Toledo.

28 Q. The city does not own the fee of that?

A. Of that we have a free perpetual gas lease, free from taxes and free from rent, in perpetuity for ninety-nine years, renewable forever. There is no annual rental. We pay so much and take the gas right exclusively to the city and its assigns. It is a perpetual gas right to the city of Toledo, its successors and assigns.

29 Q. The rock pressure on those three wells—were you present when they were gauged?

A. Yes, sir.

30 Q. How do you or how did you estimate the volume or capacity of the flow?

A. The measure was made through the tubing by what is called an open-pressure gauge, showing the number of pounds pressure that the well had in open flow.

31 Q. What was that pressure in open flow?

A. It varied in those different wells. I probably couldn't give the open flow on those different wells without reference to figures, but my recollection is in those three wells it varied from twelve pounds to fifteen, I think.

32 Q. That is, the flow of the gas out of the well open varied from twelve to fifteen pounds?

A. And when closed it ran up to 377 and 378.

33 Q. How close are those three wells together?

A. They range from eighty rods——

34 Q. I mean these three wells on the eighty-acre tract.

A. I should think the nearest, starting with No. 1—I should think No. 2 (it is not called "number 2;" it is called No. 5) is about from forty to fifty rods from it. The other number is further than that; perhaps eighty rods.

35 Q. When you made these tests and observed these tests were they all three flowing at the same time?

A. No, sir; the No. 1 was measured shortly after it was drilled in, and the measurements of the others were made when they were completed. It covered a period of—it was probably two or three months from the time that No. 1 was drilled in until the last one was drilled in upon that tract.

36 Q. So that when you drilled in No. 1 you put the rock-pressure test upon it and then the open test, and then shut it up?

A. Yes, sir; that was used for the purpose of drilling the others.

37 Q. Then the same with reference to the two other wells upon the same tract?

A. Yes, sir.

38 Q. Has there been any experiment as to the effect of the three wells drawing or flowing together would have upon each other as to their rock pressure or as to their flow?

A. No, sir; I think not; not as to the three wells, if you speak of those.

39 Q. You have no information as to what effect one well would have upon another if all three were in operation?

A. No, sir; not those three wells.

40 Q. Take the next well.

A. Do you refer to the next in distance or in period of time?

463 41 Q. The next in proximity.

A. The next well to those is a well upon a thirty-five acre tract.

42 Q. Is there more than one well upon it?

A. No, sir; just one well.

43 Q. What is the rental or price paid for the eighty-acre tract upon which the three wells are?

(Objected to by counsel for defendants upon the ground that it has no bearing upon any questions at issue in this case.)

A. I will say that we settled for that property, took it in a large settlement that involved considerable money, and there was no price fixed upon any particular piece of property. We got into difficulty with the parties who owned it, in relation to other property, and in the final settlement they conveyed us this property, together with a great deal of other property, and there was no specific price fixed upon any particular piece included in the settlement and conveyance.

44 Q. What other property than the eighty-acre piece which you speak of was included in the settlement?

A. Well, there was a large amount of property; I can't specify. There were a large number of pieces.

45 Q. How many acres?

A. In acres I think probably there were one hundred and seventy-odd in addition to some small lots and town locations and some twelve or thirteen gas wells.

46 Q. You took the eighty acres, then, and the property last mentioned by you all in one deal and settled up for it?

A. Yes, sir; that and a large amount of other property we took all in one settlement.

47 Q. What other property?

A. That which I have been speaking of.

48 Q. In acreage aggregating how much?

A. About one hundred and seventy acres, and then a number of smaller locations.

49 Q. That property would comprise how many of the twenty-three wells that you have?

A. I think it is eleven, as I count them up now.

50 Q. In the city's acquiring the gas right to this property which embraced the eleven wells is that all dealing with one syndicate or one party, or were there a number of different parties in it?

A. There were a number of different parties interested in the matter. Some of the property was held jointly, but other was held by individual members, and others, there were third parties interested in it; it was a complicated settlement and took a good deal of time.

51 Q. Can't you tell us what compensation the city paid, in round numbers, for the property embracing the eleven wells?

A. That, now, was paid at different times, ranging over a period of, well, ever since we first commenced to operate. The first money we paid I think was paid to those parties, and the last money we paid I think was paid to them, and it has ranged over a long period of time, and to get at the amount that we have paid for this property that I have named to you, embracing the eleven wells, would involve considerable labor and examination.

52 Q. Can't you approximate it?

A. I don't think I could.

53 Q. The purchase of the eighty-acre piece, you say, was so blended and mixed in with the other purchase you could not ascertain what price you paid for it?

A. That was the case.

464 54 Q. There was no separation of it?

A. No, sir; propositions were made on both sides, and counter-propositions, and the matter was discussed and rediscussed, so that we worked two or three weeks before we got the matter settled up.

55 Q. How is it as to the other twelve wells—the same condition of things?

A. Well, those are separate transactions. Perhaps some of it I might be able to give, but I couldn't pretend to give the figures on all of them without——

56 Q. These eleven wells which you have mentioned and about which we have been talking—was that the settlement with the Stewartsville syndicate or people?

A. Yes.

57 Q. Are these remaining twelve wells property the fee of which is owned by the city, or are they paying an annual rental?

A. No; there is very few of them on which they pay an annual rental—very few of them, I think. My recollection is, as I remember it now, *is* that there are three other wells on which we pay an annual rental.

58 Q. That is, nine of the remaining twelve the city owns or controls the gas territory or wells outright?

A. Yes, sir.

59 Q. Not an annual rental, but a cash payment and ownership?

A. Yes, sir.

60 Q. Are these wells being drawn upon at all now?

A. No, sir.

61 Q. They are all closed in?

A. Yes; all closed in with the exception of one well that we are trying to repair.

62 Q. Will you give these wells, taking them from No. 1, and give the capacity of each one, by number, from what you know of your own knowledge?

A. I will give them as far as I can:

Well	No. 1 has a capacity of	2,400,000 ft.
	No. 2	11,500,000 ft.
	No. 3	9,400,000 ft.
	No. 4	5,998,000 ft.
	No. 5	2,700,000 ft.
	No. 6	8,500,000 ft.
	No. 7	7,250,000 ft.
	No. 8	8,750,000 ft.
	No. 9	5,100,000 ft.
	No. 10	6,000,000 ft.
	No. 11	7,300,000 ft.
	No. 12	11,800,000 ft.
	No. 13	8,100,000 ft.
	No. 14	9,500,000 ft.
	No. 15	2,600,000 ft.
	No. 16	3,200,000 ft.
	No. 17	9,500,000 ft.
	No. 18	6,820,000 ft.
	No. 19	9,400,000 ft.
	No. 20	6,200,000 ft.
	No. 21, No. 22, No. 23 } I have made no examination of.	

It is possible I may have got Nos. 7 and 8 changed. I know them better by names than by numbers. Wells Nos. 9 and 13 I made no personal examination of.

63 Q. But as to all of the others, you were present when the gauge was put on the wells to test the rock pressure, and also the capacity?

A. I was present. I think I have seen the rock-pressure gauge on all of those wells, but sometimes we did not have the rock-pressure gauge with us when the well was measured. It is not necessary to have it, but the pounds pressure on all of those wells was taken by me, and I think I have seen the rock pressure of all of them.

465 64 Q. And the open pressure registered twelve to fifteen pounds per square inch?

A. No——

65 Q. What were the others?

A. They ran all the way up to thirty-nine pounds. The twelve to fifteen pounds was in regard to the three wells you spoke of.

66 Q. And the balance ran up to what?

A. Ranging all the way from twelve pounds. I don't think there were any lower than twelve; from twelve up to thirty-nine pounds.

67 Q. All flowing through the same diameter of pipe, were they?

A. No, sir; some of these smaller wells. There are three or four of these wells that are in two-inch tubing.

68 Q. And the highest capacity is what?

A. We have three and four inch.

69 Q. You get the highest pressure of the natural flow from the smaller pipe, don't you?

A. Up to a certain point. After you get a gas well up to a certain point—certain capacity—it does not make any difference how much larger it is. You can only get so much gas through it and get so great a pressure. You can only get thirty-nine or forty pounds.

70 Q. Your largest pipe is four-inch?

A. Yes, sir.

71 Q. The highest pressure is in what pipes, as regards diameter?

A. The highest pressure we got was from the largest pipes, because the wells were larger.

72 Q. The capacity of the flow of a well is taken when the entire rock pressure is removed?

A. Yes; the well is left open until it reaches normal, and then the open pressure is taken.

73 Q. How do you determine when, say, a well is closed in or corked in and runs up to a pressure of 375 pounds, rock pressure, and you take that off, how long does it take to run it down to its normal pressure, in open flow?

A. It depends upon the size of the well, and the larger wells sometimes run down quicker than the smaller ones.

74 Q. Does it depend anything upon the size of the pipe?

A. Yes, sir; of course.

75 Q. In making these tests you remove the gauge which would show the rock pressure, and how long do you let it flow before you make the test for capacity of the well? For instance, take your No. 4, which shows a flow of six million cubic feet every twenty-four hours.

A. That well was allowed—I measured on that day several wells. That one was allowed to run, I think, about an hour and a quarter, and then we took the open-pressure test at intervals along after about the first thirty minutes, and by comparing the tests we found when it ceased to get any lower. We took the tests at fifteen-minute intervals.

76 Q. How long would you continue those tests?

A. How long would we hold the gauge on the pipe?

77 Q. Yes; state that.

A. I should say that the gauge was usually held in thirty seconds, and then we would take it out and immediately put it back again, and probably put it in two or three times while we staid at the well, and then go back and wait fifteen minutes and then put it in again.

466 78 Q. In making these tests as to the capacity of the flow did you continue it at intervals during the entire twenty-four hours, or simply to about the time of taking off of the rock-pressure gauge?

A. No, sir; they were not continued at intervals. Some of the wells, however, were allowed—some of our larger wells would blow all day, and measurements taken at two or three different times during the day. We found in those wells no variation after the rock pressure was once off.

79 Q. They remained substantially the same?

A. Yes, sir.

Re-examination:

1 Q. You have said that on the first three wells you didn't allow all three of them to flow for the purpose of testing the effect of one flowing well upon another in close proximity. Have you seen that done in other cases?

A. Yes, sir.

2 Q. Where?

A. In the Stewartsville field, right near the crossing of the Nickel Plate and the Toledo & Findlay railroad.

3 Q. What was the effect, as you noticed it?

A. Well, I will first state that the wells which were being tested were, I should think, about forty-five or fifty feet apart. One of them was owned by the city of Findlay and the other by a company of farmers, and they would close in one well and open the other and then change, and there was no perceptible difference in the flow of the wells.

4 Q. How long was that experiment continued?

A. I don't know how long it was continued; I think I was there about an hour.

5 Q. Were you there when that well was shot?

A. Yes, sir.

6 Q. Will you just describe the location of the two wells? State what was done at that time and what effect the shooting of the second well had upon the first.

A. At the time I went there, and when I got there, the well owned by the city of Findlay was closed in. It had never been connected with their line. It had been recently drilled. It was a large well, probably fifteen or eighteen million feet. The well drilled by the farmers was forty-five or fifty feet away on an adjoining lot. When it was drilled in it was a very light well; I should not think over a million feet.

7 Q. In what neighborhood are they as compared with the Mellott well, known as the largest well in the field?

A. They are north and west of it—of the Mellott well—perhaps about two hundred to three hundred feet north and west of the Mellott well. When I got there they had put a shot in the well just drilled in by the farmers, and were about to shoot it. One of the Findlay trustees was there and had the Findlay well turned on. He thought he ought to take the pressure off of their well so it wouldn't burst through when it was shot. It was shot with eighty quarts of glycerine. The Findlay well had been running, I should think, twenty or thirty minutes when the Farmers' well was shot.

I stood right close to it and behind a tree, where I could see the gas coming from the Findlay well; it was in the woods. The gas was dry and blue, and you could see it just as plainly as though it were on fire. When the shot exploded in the Farmers' well there was no particular difference that any one could see in the continued flow of the Findlay well.

467 8 Q. What do you know about the Findlay well maintaining its flow from that time on down until now—whether or not it continues as a good flowing well?

A. I can't say personally, of my own knowledge. Findlay connected it some two or three months ago.

9 Q. What was the effect upon the Farmers' well of that shot?

A. It was greatly increased; it has been since measured by Prof. Orton. I saw his written statement that it was an eight-million well.

10 Q. Are you familiar with the well drilled immediately north of the Mellott well, across the road?

A. That is about one hundred and fifty or two hundred feet northeast of the Mellott well; that is the Cary-Harris well.

11 Q. State whether that was a large or a small well.

A. Very light before it was shot, probably not more than half a million; and we tested it afterwards, and it was only about a million and a quarter, and it is only 150 or 200 feet from the Mellott well.

12 Q. When that well was drilled in state whether the Mellott well was blowing off or shut in.

A. It was shut in.

Recross-examination:

1 Q. What are the boundaries or limits of the Stewartsville field, as you understand it?

A. I should say the Stewartsville field, if you include in that the Van Buren—and it usually is—is about five miles north and south and three and a half miles east and west, as now developed.

2 Q. How many wells are there, in round numbers, drilled in in the Stewartsville field altogether?

A. Well, I can't answer that.

3 Q. Can you approximate it?

A. I could give my judgment as to the number.

4 Q. I wish you would.

A. I should think that there were in the field perhaps fifty wells. We have more wells in that field than anybody else by far.

5 Q. And those all are closed in?

A. Yes, sir; they are all closed in excepting one that they are repairing.

6 Q. Do you know what the average daily output or flow of the gas is from the other twenty-eight wells in the field?

A. No, sir; I can't give it.

7 Q. Can you approximate it?

A. No, sir; I couldn't, because I have never measured them; but

there are not anywhere near that number in use in the Stewartsville field.

8 Q. How many of them are there in actual use, not including your own?

A. Of course ours are not in use. I think the Northwestern has the Mellott and the Kagy and, I think, the Crowell well. I think they have not over three or four wells that they were using in that territory the last time I was down there. The village of McComb has one that has always supplied them with gas, and Findlay only has a very few, perhaps as many as the Northwestern, that they have connected up.

9 Q. You understand that the city of Findlay is now drawing on the Stewartsville field substantially for its supply?

A. I know that they have connected with—I know personally of only two wells that they have connected with there; and I have no doubt but what those two wells are furnishing Findlay at the present time, substantially.

468 10 Q. How far is the Mellott well from any of the city's wells?

A. That is about one hundred and twenty feet from our nearest well.

11 Q. What well is that?

A. I think that is No. 7; it is what we call the "Skinner No. 1."

12 Q. Those wells are in about the centre of the territory or the Stewartsville field, are they?

A. No, sir; I don't think they are.

Also JOHN MCINTYRE, of lawful age, being first duly sworn, testified and deposed as follows:

Direct examination by Mr. BROWN:

1 Q. Will you state your name, age, residence, and occupation?

A. John McIntyre; age, 52; residence, Toledo, Ohio. I have been in the real-estate business here for the last two years, prior to the last six months, and for the last six months in the oil and gas field.

2 Q. What experience have you had in the oil and gas field of Northwestern Ohio since the development of oil and gas in Northwestern Ohio?

A. I have had considerable experience within the last four or five months—since the first of June. I have been through the gas field several times, with a view of getting into business, within three years past. Two years ago last spring I came here for the express purpose of going into the business.

3 Q. Since that time have you been more or less about the gas fields?

A. Yes.

4 Q. What experience have you had elsewhere?

A. I have had five years' experience. I commenced in Pennsylvania in 1865, and up to 1870 I was continuously in the business.

5 Q. During the past three ysars, and particularly during the past

six months, have you had occasion to travel about through the natural-gas field of Northwestern Ohio, known at the Findlay field, and that to include all the gas field in that region?

A. Yes, sir.

6 Q. And have you had occasion to know and see the wells in the different parts of the field?

A. Yes, sir.

7 Q. I will ask you if you are familiar with the extent of the developments of the gas field at present in Northwestern Ohio.

A. Considerably so.

8 Q. Will you state the territorial extent of the developed gas field in Northwestern Ohio at present, describing it as best you can, by the known development, by wells? And for the purpose of aiding you I will exhibit to you a map of Ohio and ask you to describe the points and point them out on the map.

A. The furthest west that I know anything about is Bryan, Ohio. I was in Bryan nearly two years ago. I went there, and they showed me their gas works that they had there—an officer of the company. I had quite a long conversation with him. They were using gas when I was there, and he told me then the extent of their wells, some two or three wells that they were using there in the town. That is the furthest west I know anything about the field.

469 9 Q. Referring particularly to what is popularly known as the Findlay field, and by the Findlay field I mean to designate what is popularly known as the Findlay field and including all the field in Hancock, Wyandot, Wood, Sandusky, Seneca, and Ottawa counties?

A. You commence at Houcktown, which is in section 27 of Jackson township, Hancock county, about seven miles south of Findlay and about three miles east of Findlay, where there are gas wells; then from there to Upper Sandusky, which is about seventeen miles east of Houcktown, where there are gas wells, and then from Upper Sandusky to Oak Harbor, which is north of Sandusky, it would be about forty-eight miles. There are some wells there at Port Clinton, quite good wells, so that they use them on grist-mills and for private houses. That would be fifty miles from Upper Sandusky. Then I might mention Lindsey; there are several wells there. It is on what is called the Norwalk Division of the Lake Shore road. It is in Sandusky county.

10 Q. Where are there gas wells to the extreme west of this Findlay field?

A. McComb is about the furthest west, I guess, that you can call in this field.

11 Q. Where is McComb with reference to Findlay?

A. It is eight miles west and about five miles north of Findlay.

12 Q. How far north from Findlay in this field are there developments?

A. Bowling Green is as far as I can consider the field, as I think, properly.

13 Q. Then I understand you would say that the developed Findlay field at present might be limited on the south by Houcktown, in

Jackson township, Hancock county; on the southeast by Upper Sandusky, in Wyandot county; on the northeast by Port Clinton, in Ottawa county; on the west by McComb, in Pleasant township, Hancock county, and on the north by Bowling Green, Wood county?

A. Yes, sir.

14 Q. Now, I will ask you to state, approximately, what is the distance between the extreme southern and the extreme northern limit of this field as you have defined it.

A. According to the scale of the map, it would be about fifty miles, take it in a little northeastern direction, say from Upper Sandusky to Port Clinton.

15 Q. What would be the distance directly north and south, through Findlay, on a line with Upper Sandusky, to Bowling Green, through Findlay?

A. That is about thirty-seven miles.

16 Q. And what would be the distance east and west from McComb to the line running from Upper Sandusky to Port Clinton?

A. It would be thirty-three miles.

17 Q. You may state, if you know, whether there are paying wells—that is, wells from which gas is used either for domestic or manufacturing purposes—at all of the points that you have named within the Findlay field.

A. I don't think there is any wells being used now from this extreme westerly point that I have mentioned—McComb—although there was two or three wells sunk there, and although one of those wells, the parties told me, was a very good well and they thought would be sufficient to run the village of McComb if it had been taken care of.

(That portion of the answer given from hearsay objected to by counsel for complainants.)

470 18 Q. How near to McComb is the nearest well that is being used?

A. It is eight miles from McComb to Van Buren. They are using from that well and have been for the last two or three years; and there is some wells—two of them—at North Baltimore, about the same distance from McComb that those are, although there has some wells now recently been drilled still further west, between McComb and these points, that are considered good wells—two or three million cubic feet.

19 Q. How recently have been the developments of natural gas in large quantities in the vicinity of Upper Sandusky?

A. I don't know as I can state just how recently. I think they are putting down wells there now.

20 Q. How recently have these large wells been drilled in at Upper Sandusky?

A. I think it is within the last ninety days or about that time—somewheres about three months ago.

Cross-examination by Mr. POTTER:

1 Q. How long have you been in the employ of the trustees of the city of Toledo?

A. I think somewhere about the 20th of June up to the first of November.

2 Q. You are not now in their employ?

A. No, sir; not particular; not in the employ of the trustees.

3 Q. Not regularly in their employ?

A. No, sir.

4 Q. I suppose you have been employed by them to some extent since then, haven't you?

A. Yes, sir.

5 Q. With reference to some expert testimony on the subject of this gas question?

A. I don't know as you would really consider it for that purpose. I have been to see some parties for them upon that subject.

6 Q. And to aid and assist in procuring the testimony that has been produced on behalf of the defendants in this case?

A. Yes, sir.

7 Q. How long have you been investigating the gas question in this State—the northern part of this State?

A. Two years last spring.

8 Q. You are, I take it, substantially familiar with all the gas territory in the northwestern part of this State?

A. Well, considerably so.

9 Q. Have you examined the wells at Port Clinton?

A. I have not examined those wells particularly; I have visited there.

10 Q. Have you ever seen any test made of the rock pressure and the supply of the gas wells at Port Clinton?

A. I never did; no, sir.

11 Q. Do you know anything about the pressure of the gas in that locality?

A. I do not.

12 Q. Or at Lindsey?

A. No, sir.

13 Q. Or at Upper Sandusky?

A. Nothing; only hearsay.

14 Q. Have you been there to investigate or inquire after the territory or with reference to the purchase or lease of gas territory in those localities?

A. I have examined them.

15 Q. What localities?

A. In Ottawa county. I have been to Port Clinton and Oak Harbor.

471 16 Q. To what extent have you investigated that locality as to the supply of gas and the liability of the supply in Ottawa county—pretty fully?

A. I don't know whether you would consider it pretty fully. I have been there quite a number of times. I am acquainted with a

good many parties and have made a good many inquiries of parties there.

17 Q. Prior to your connection with the trustees?

A. Yes.

18 Q. And since?

A. No, sir; I have not since.

19 Q. There has been no effort on the part of the trustees, so far as you know, to procure any gas territory in Ottawa county, has there?

A. No, sir.

20 Q. And from your investigation of the territory in Ottawa county your opinion would be that the supply of gas there would hardly justify an investment by the trustees in the Ottawa county field?

A. I rather think that it would. I have never said it to them, but I am of the opinion that there is some good gas territory in Ottawa county.

21 Q. Do you know of your own knowledge the extent to which the rock pressure of the gas has been tested in any portion of Ottawa county?

A. I don't know.

22 Q. Do you know, of your own knowledge, the extent to which the wells are producing in Ottawa county?

A. No; I couldn't state that. I have never measured them at all. I have seen the wells there.

23 Q. Take it in Wood county—Bowling Green—have you investigated that locality and the field with reference to the rock pressure and the supply of gas in that surrounding?

A. Yes, sir; but I never have seen any of the wells measured or tested there.

24 Q. Have you made any investigation in that locality in reference to the practicability of investment by the city or the trustees?

A. I have not for them; I have for myself.

25 Q. What is your judgment, from your knowledge and observation of the Wood county field, as to its being of such pressure or supply as would justify or make it practicable to invest there for the transportation of gas to Toledo?

A. There are some portions of Wood county that I am satisfied in my own mind that would pay to sink wells and fetch it to Toledo.

26 Q. To what extent is the territory in Wood county already appropriated?

A. There has quite a good deal of Wood county been drilled over for gas. There are some nearly as good wells in Wood county as in the whole field.

27 Q. Whereabouts in Wood county?

A. The best well I know of in Wood county is what is known as the Simmons well.

28 Q. When was that drilled in?

A. That was drilled in—it must be three years ago, I guess; perhaps a little over. I think it was drilled before I got back here from the West, three years ago.

29 Q. You know nothing about the rock pressure or supply from that well?

A. No, sir. I have never tested it.

30 Q. How far is that from Toledo?

A. I can tell you about how far it is from Toledo. It is not far from thirty miles.

472 31 Q. You say the Wood county territory has been pretty well drilled over?

A. It has been pretty well tested—developed. There has been a good many wells sunk; it has been pretty well tested and some of it found to be pretty good territory.

32 Q. But you know nothing about the supply or output of any of the wells in Wood county of your own knowledge?

A. No, sir; I don't. About the only thing I could tell you would be what I have heard and the reports from those wells.

33 Q. Upper Sandusky. About how far is the Upper Sandusky field or wells from Toledo?

A. About sixty-five miles.

34 Q. To what extent has that territory been tested, as to the yield of gas?

A. I can't tell you. There are several wells put down there; I couldn't tell you just how many.

35 Q. In the immediate vicinity of Upper Sandusky?

A. Yes, sir; in what would be considered the immediate vicinity of Upper Sandusky.

36 Q. You say that the extreme southern limit, so far as you know now, of development is at Houcktown; that is southeasterly of the city of Findlay?

A. Yes, sir.

37 Q. And by actual test that seems to be, so far as you know or are able to learn, the extreme southern limit of the gas field or territory?

A. Yes, sir; so far as I know.

38 Q. Do you know, of your knowledge, of the wells there and their production and pressure?

A. No, sir. I have never tested any of them nor seen them tested.

39 Q. Findlay is about forty-two miles from Toledo, is it?

A. Forty-four.

40 Q. McComb, that is northwesterly of Findlay, is it not?

A. Yes; about five miles north and eight miles west.

41 Q. Do you understand how much that immediate locality has been developed for gas?

A. No, sir.

42 Q. The rock pressure or supply?

A. No, sir; I don't think any of them ever took the rock pressure of the wells.

43 Q. Do you know to what extent the territory in the immediate vicinity of McComb has been tested or drilled?

A. Something about it. I know there has several wells been drilled in within the past summer between McComb and North Bal-

timore, and Mr. Cloud and Wright put down two or three wells. There is a well put down there on the Crawford farm. I went to visit that well with a view to buying.

44 Q. How far is that Crawford well from McComb?

A. About six miles northeasterly.

45 Q. Do you know or are you able to state the extent to which the territory has been developed in that locality?

A. There have been some five or six test wells put down, and probably within a radius of five miles during this past summer. I think that is the extent of the development in that section.

46 Q. Do you know of your own knowledge what the result of those tests was?

A. No, sir; I don't. I know that there was three different wells that they found gas without any oil—that is, Cloud and
473 Wright; they were developing oil territory and they struck a very good gas well. I don't know how much it produced, but I judge between a million and a half and two million feet. I should think that was within four miles of McComb and about the same distance from North Baltimore.

47 Q. In this territory, the limits of which you have designated east, west, north, and south, where is the maximum yield—in what locality?

A. In the vicinity of Stewartsville.

48 Q. How far from Toledo?

A. About thirty-six or thirty-seven miles from Toledo; I guess it is a little further than that—thirty-seven or thirty-eight miles.

49 Q. What is the extent, so far as you know, east and west and north and south of this Stewartsville territory, as developed, in miles?

A. I don't know just what you would call Stewartsville territory; but that development—you might run that up as far north as this Simmons well—that is one of the big wells. It would be five or six miles from Stewartsville.

50 Q. North and south?

A. Yes, sir.

51 Q. And east and west, what would you say?

A. It is about eight miles east and west; not far from that.

52 Q. And as you go north or south or east or west from this maximum of yield the yield and pressure, so far as you know, is lessened, as a general rule?

A. I understand, although I don't know it as a fact, because I have not seen them measured, but I understand that the pressure—as you go east and south the pressure is greater—that is, they claim more pressure than in the Stewartsville field proper.

53 Q. And as you go northeast and northwest, how is it?

A. I don't think there is much variation in it. I think it is about the same as it is at Stewartsville, as far as I know.

54 Q. What do you understand to be the yield and pressure of the Simmons well when it was first drilled in?

A. I understand that to be about four hundred pounds.

55 Q. When was that drilled in?

A. I think the Simmons well was drilled in three years ago or a little over.

56 Q. Do you know what uses it has been put to since it was drilled in?

A. Yes, sir; it has been connected with the Northwestern line.

57 Q. As to what its present yield or pressure is, are you informed?

A. I can't state.

58 Q. The territory as you have described it—its limits—is irregular in shape?

A. As far as I know, it is.

59 Q. In some localities within the territory where tests have been made no gas is found at all?

A. I presume that that is correct.

60 Q. That is, no gas of such volume or quantity or pressure as to justify its use?

A. There is no doubt about it, because right in the vicinity of good wells you will often strike failures.

61 Q. And in this locality, in the same territory, I suppose there are found oil wells also?

A. Yes, sir; there are oil wells within this radius that I have bounded.

474 63 Q. You say you had some five years' experience in the Pennsylvania field?

A. Yes, sir.

64 Q. In gas wells or oil?

A. In oil wells.

65 Q. Have you had any experience with the gas wells of Pennsylvania?

A. I didn't. At that time the gas was not utilized as a fuel, except as we used it for drilling purposes.

66 Q. In what portion of Pennsylvania were you?

A. In Venango county principally. I was in what is known as the Oil Creek field. I never was in Bradford much.

67 Q. Was there much development of the gas territory?

A. Not much in gas. The best thing I saw in gas was a well between West Hickory and Pithole, about four miles and a half from Pithole. That well was drilled in, I think, in 1864. They didn't get any oil and they got a tremendous flow of gas. That well was left flowing; it was not used as long as I was in the country. It was left to flow openly there. That was lit at times. I don't know what the pressure was. You could hear that well for two miles in a still day. It was tubed with two-inch tubing and run up probably eight or ten feet above the top of the derrick; it roared there.

68 Q. Really, I suppose, as far as your service in Pennsylvania is concerned, it was more particularly with reference to the development and production of oil territory than gas territory?

A. Yes, sir.

69 Q. Have you any personal knowledge yourself as to the volume, supply, or durability of the gas wells in the Bradford district?

A. No, sir.

70 Q. Or in any other portion of Pennsylvania?

A. No; I have not had anything to do with the field in that State since they commenced to use gas as a fuel.

71 Q. In the last two years in Ohio, I suppose you have had occasion to investigate the Findlay locality and the immediate locality of the city of Findlay?

A. Yes, sir; have been in Findlay a good many times.

72 Q. Are you acquainted with the Karg well and its history, and also with the wells drilled in its immediate vicinity?

A. I have seen the Karg well several times and seen it open. I have not seen that well opened up since a year ago last summer.

73 Q. It is closed in, as I understand it, now?

A. Yes, sir; I don't know anything about it since then, only from hearsay. I have not seen it open and know nothing about its developments.

74 Q. Had you a knowledge of the pressure, volume, and supply of the gas wells in the city of Findlay and its immediate vicinity?

A. No, sir.

75 Q. You have never had occasion to investigate them so as to be able to state, of your own knowledge, the extent to which it has been used or its production?

A. No, sir.

76 Q. Do you know, as a matter of fact, that Findlay is now drawing for its supply of gas substantially upon what is called the Stewartsville field?

475 A. I know they have made connections with some of the wells in Stewartsville field within the last six weeks.

77 Q. Some among the largest wells in the Stewartsville field?

A. Yes; you might consider them so.

78 Q. How far from Findlay are they?

A. Five miles.

79 Q. Where, with reference to Findlay, is the Mellott well?

A. The Mellott well is five miles north and about a half a mile east from what is known as the Findlay pike, running north.

80 Q. That is the largest well that has been discovered or developed in this entire gas territory?

A. The only thing I can tell you about that is hearsay.

81 Q. But as far as you know?

A. Yes, sir. Well, I couldn't say as far as I know, because I have only heard of that well, and I have seen other wells measured myself and can state more positively.

82 Q. What is the highest volume of well in this territory that you know of your own knowledge?

A. Do you want to know the pressure?

83 Q. Take the volume—I suppose you mean the capacity in twenty-four hours?

A. Yes; the cubic feet of gas. There is a well I know a good deal about, but I didn't see the measure of that well. I was right there and could have seen it; that they claimed a little over eighteen millions. That belongs to the Dewey Stave Company. I didn't see the measure of that myself. That is in Stewartsville. I have seen

wells measured there that showed between sixteen and eighteen million cubic feet.

84 Q. Right in that immediate locality?

A. Yes, sir.

85 Q. Within a radius of how much?

A. Within a radius of half a mile.

86 Q. And that locality has developed the highest capacity of wells known in this gas territory?

A. Yes, sir.

87 Q. In your employment for the trustees has your service been to investigate the gas territory or to negotiate purchases for the trustees?

A. It has been partially to negotiate for territory, and then I have had the superintendency of some of the wells while they were being drilled in.

88 Q. You spoke of the territory of Bryan; are you familiar with the extent of the developments there?

A. No, sir; I am not familiar with it.

89 Q. Have you been there?

A. I have been there—that is, I was there and saw gas burning in several different places there; and then I was in the superintendent's office and he explained the whole system there to me, about the extent of the wells, and so forth, but that is all I know about it.

90 Q. Do you know the final outcome or the present condition of the gas territory in and around Bryan and in that locality?

A. I do not.

91 Q. What, if anything, do you know about the durability of the wells in the city of Findley—when they were drilled in and what has been the result of the production?

A. I don't think that I could tell you. I don't know of my own personal knowledge.

92 Q. At one time you know that they had a good many
476 wells in there about the city of Findlay, don't you?

A. I know they have now.

93 Q. And you know that the most of them are what is called "closed in" now?

A. No, sir; I don't know that.

94 Q. You don't know whether they are or not, I suppose, of your own knowledge?

A. No, sir.

95 Q. From your own knowledge and observation of the gas territory as developed in this section of the country, would you be able to state what would be the duration of a gas well flowing continuously at its full capacity from the time it was drilled in?

A. I wouldn't be able to state how long it would last. I don't think any man is wise enough to know that. I think it would be only guess-work with any man. It would depend largely upon the circumstances. There is, in some localities, some wells that might last year after year. My opinion is that you take a well drilled in a territory where you get from a three to a five million well you will

have a rock pressure of four hundred pounds; I think that would run down, if it was left open, perhaps in a year's time. It might run down in its rock pressure to a certain extent, but I have an idea that it would flow gas for a great many years after that.

96 Q. The life or durability of a well is dependent upon, of course, the extent to which it is drawn upon, and, furthermore, the contingency of salt water or oil, if there is oil in a well, or oil pressure coming — contact with the escaping gas, I suppose?

A. That would have something to do with it. In most any of these wells we have that. If they are drilled below a certain depth into the Trenton rock there is a liability to encounter salt water or oil.

97 Q. If they do that, then what?

A. Well, the result is that you get into water. If it is left to its own accord the water will naturally raise in the well, and, in some instances, it will flow gas to a certain extent.

93 Q. Where a well discharges oil, salt water, and gas at intervals, what would you say as to its being a well practicable to use as a supply well for gas as a fuel?

A. It can be used practicably by using a separator.

94 Q. Would that be practicable in the transportation of gas for a long distance—say, twenty-five, thirty to forty miles?

A. Yes; I consider that it would, for this reason: I know that the Northwestern have been putting in several of these separators this fall, and they are connecting their wells to the main line which are running here, and for the purpose of running to Detroit, and they must consider it practicable or they wouldn't do it.

95 Q. What is your theory of the gas supply and the pressure or force with which it is thrown or forced from the well—is it the expansion of the gas itself, the confinement and expansion of it, or is it, in your opinion, a water pressure, or hydraulic pressure?

A. I, of course, can't state from my own knowledge what makes this pressure; whether it is the water or the pressure of the earth, or what causes the pressure, really. We know that we get a pressure, and a large pressure, not only in gas, but also in water. In
477 a good many places in Dakota, where I was, we got water wells there with a pressure of two hundred and thirty or two hundred and forty pounds, in a level country. There have been a great many theories as to what created that pressure there, whether it was from a high head and brought from a long distance, which would have to be a good many miles away, or whether it was the pressure of the earth upon it. I don't know that I have any definite theory about it.

Re-examination:

1 Q. Speaking of the development in the vicinity of Houcktown, you may state whether or not those are small experimental developments, or whether gas has actually been piped from that field.

A. Gas has been actually piped from that field.

2 Q. To what town?

A. Kenton, I understand, gets her supply from that town or near there or that immediate vicinity.

3 Q. These developments in the vicinity of McComb and North Baltimore and Van Buren—you may state whether or not those are experimental or whether gas is piped to McComb and North Baltimore.

A. The gas is piped from a well in Van Buren and McComb; that I know, and I know that North Baltimore has got her gas from wells within a half a mile from town. I don't know but what they are inside of the village limits.

4 Q. These developments at Upper Sandusky—state, if you know, the size of these last wells developed down there, and whether they are large or small wells.

A. They are reported as one of the largest wells ever struck in the State of Ohio. They claim it at forty millions.

5 Q. I will ask you whether these large wells at Upper Sandusky were the most recent developments there or earlier development.

A. Yes; they have been within the last three months.

6 Q. Do you know whether there were developments of gas there before these large wells?

A. Yes; I think so. I think I have visited the old wells there which have been producing gas. They were small wells.

7 Q. You have spoken of the Karg wells being closed in?

A. No, sir; I don't say it is closed in.

8 Q. Mr. Potter used that expression, and you said yes?

A. I said I didn't know.

9 Q. Now?

A. Then I would recall it, because I certainly don't know.

10 Q. Do you mean to say that the well is abandoned, or that it is not flowing in the open air?

A. No, sir; I don't want to say that it is abandoned, nor it is not flowing in the open air.

11 Q. And you haven't seen it flow in Findlay for a year and a half?

A. I have not seen it flowing for a year and a half. I have seen the well within the last four days.

12 Q. Do you know whether it was some time ago connected with the system which supplies Findlay?

A. Yes; I suppose it was. I know they had a pipe connected with it—supposed to be connected in their line.

478 Recross-examination:

1 Q. I understood you to say that as a matter of fact you know nothing of your own knowledge of the capacity of the Upper Sandusky well?

A. No, sir.

2 Q. And the report of the well at Upper Sandusky yielding forty million cubic feet is mere hearsay?

A. That is what it is; it is so reported.

3 Q. It is often true that these reports as to the capacity of wells are greatly exaggerated, is it not?

A. Yes, sir.

4 Q. At one time the Karg well at Findlay was reported to have a capacity of forty million cubic feet a day?

A. Yes, sir.

5 Q. Whereas it was only twelve millions or so?

A. Yes; I know that I have seen it advertised that the Karg well was forty millions.

By agreement of counsel the testimony taken heretofore in this case may be considered as taken within the time fixed therefor by the order of the court with reference thereto.

I, Edward H. Smith, a notary public within and for the county of Lucas and State of Ohio, duly commissioned and qualified, do hereby certify that the above-named William T. Walker, Lucius Brown, William Kirkby, A. E. Macomber, Thomas R. Wickenden, H. W. Compton, Hamilton S. Corwin, Harry C. Cotter, Harmon F. Gettlemen, Edward Orton, Charles L. Stock, Archibald McDougal, Abraham Hasbrook, James C. Mills, Jerome M. Martin, Richard W. McCamey, W. R. Carnahan, E. B. Phillips, John Wolfe, John J. Owens, Thomas H. Tracy, and John J. McIntyre were by me severally sworn to tell the truth, the whole truth, and nothing but the truth; that the depositions were by me written in shorthand in the presence of the witnesses, and afterwards reduced to their present form by express stipulation of counsel in this case, on file in this case, and for that reason the signatures of the witnesses are not appended hereto; that the above is a full and correct transcript of the notes of testimony so by me taken, to the best of my knowledge and belief.

I further certify that I am not counsel, attorney, nor relative of either party hereto or otherwise interested in the result of this suit.

In witness whereof I have hereunto set my hand and seal of office this 6th day of December, A. D. 1889.

____ ____,

Notary Public, Lucas County, Ohio.

The costs for taking the foregoing depositions are as follows:

To writing depositions, — folios, at 20 cents--------$.

479 In the Circuit Court of the United States for the Northern District of Ohio, Western Division.

JAMES W. FELLOWS *et al.*, Complainants,
vs.
WILLIAM T. WALKER *et al.*, Defendants.

Depositions taken before me, James H. Emery, a notary public within and for the county of Lucas and State of Ohio, by agreement of parties, without notice, at the office of the auditor of Lucas county, Ohio, on Wednesday, the 13th day of November, A. D. 1889, to be read in evidence on behalf of the defendants in an action pending in the circuit court of the United States for the northern district of Ohio, western division, in which James W. Fellows *et al.* are complainants and William T. Walker *et al.* are defendants.

Appearances: For complainants, E. D. Potter, Jr., Esq.; for defendants, Guy W. Kinney, Esq.

CHARLES A. VORDTRIEDE, of lawful age, being by me first duly sworn, as hereinafter certified, testified as follows:

Direct examination by Mr. KINNEY:

1 Q. What official position do you hold?
A. County auditor of Lucas county, Ohio.
2 Q. How long have you held it?
A. This is my fifth year.
3 Q. Can you tell us what proportion of the taxes levied by the county are paid by the city property?
A. The property in the city of Toledo pays 81% of the county taxes.
4 Q. Can you tell us what the cost of heating the court-house and county jail is on the basis of natural gas as now charged?
A. $735 per year for all but one fire.

Cross-examination by Mr. POTTER:

1 Q. Will you give a little more in detail the items that make up this aggregate amount, upon which it is based?
A. The Toledo Natural Gas Co. of Toledo is to furnish for use in county court-house and county jail natural gas for
480 heating purposes for 26 heating stoves, with $5 mixers, and three furnaces, with # E combinations, for one year from the time of turning on gas, for $735 per annum.
2 Q. You said this does not include one fire?
A. There is one fire in the prosecuting attorney's room that is not included, for which there is a separate contract. Mr. Southard made a contract individually for that.
3 Q. These heat the offices of the treasurer, auditor, county surveyors, stenographers, probate judge, and also the offices of the clerk

of the courts, recorder's offices, sheriff's offices, three court-rooms, three jury-rooms, and the grand-jury room?

A. That is all in the court-house, and then there is the sheriff's residence and the jail and the cooking part of the jail—cooking range.

4 Q. Does it include heating privies?

A. Yes; there is one stove out there.

5 Q. Privy vaults, I suppose you call them?

A. Yes.

6 Q. What was the cost on the basis of coal for the same service per annum?

—. From the quarter ending September 1st, 1884, to the quarter ending September 1st, 1887—three years—$4,387.67.

STATE OF OHIO, *Lucas County.* } ss:

I, James H. Emery, a notary public in and for the county and State aforesaid, duly commissioned and qualified, do hereby certify that the above-named Charles A. Vordtriede was by me sworn to testify the truth, the whole truth, and nothing but the truth, and that his deposition as above set forth was reduced to writing by me in his presence; that by consent of parties hereto the signature of said witness was waived, and that said deposition was taken at the time and place above stated, by consent of counsel, without notice.

I do further certify that I am not counsel, attorney, or relative of either party or otherwise interested in the event of this suit.

In witness whereof I have hereunto set my hand and seal of office this 13th day of November, A. D. 1889.

JAMES H. EMERY,

[SEAL.] *Notary Public in and for Lucas Co., Ohio.*

(Here follow maps marked pp. 481, 482, & 483.)

484 EXHIBIT No. 3 TO DEPO. OF. N. S. CORWIN.

To the stockholders of the Northwestern Ohio Natural Gas Company:

This company was organized August 10, 1886. Operations were commenced at once to put in a plant at Fostoria. At this time the company bought the illuminating gas plant at Fostoria and came into possession of the same September 2, 1885. The plant was completed at Fostoria about the 1st of December, 1886.

We also purchased the fuel-gas plant at Fremont, Ohio, November 16, 1886, taking immediate possession thereof and proceeding without delay to complete the plant at that place and also in the towns of Amsden, Kansas, and Burgeon, upon our line, to Fremont.

On or about January 20, 1887, in connection with a large amount of leases, we acquired the fuel-gas plants at Bloomdale, Bairdstown, and Van Buren.

We commenced the line to Toledo January 1, 1887, and had so

far completed the plant at Toledo as to commence the sale of gas in that city about the 1st of September, 1887. The report of receipts covers the whole time of our existence, or about two years since we commenced selling gas at Fostoria and other places, and it also covers receipts from the illuminating plant at Fostoria from September, 1886.

Our report closes November 30, 1888, for the reason that owing to the early date of our meeting in January we are not able to get the facts for December.

Statement of Earnings to and Including Nov. 30, 1884.

Gross earnings derived from fuel-gas earnings at Toledo	$194,008 51
From all other sources	170,949 76
	$364,958 27
Operating expenses for repairs of lines, wells, buildings, telegraph, &c.; also for operating lines and wells, telegraph and office expenses, taxes (not including taxes for 1888) due and unpaid	120,970 70
Net earnings	$243,987 57

485 Out of this amount there has been paid:

Two dividends, aggregating	$120,000 00
For plant in excess of capital stock	52,049 42
Leaving a surplus of	70,938 15
	$243,987 57

The following is a condensed balance-sheet of the company Nov. 30, '88:

Assets.

Plant.—In plant of about 282 miles of pipe of various sizes, rights of way for same, gas territory, wells supplying same, connections, rigs, machinery, fittings, and apparatus connected therewith, &c., &c.	$4,053,049 42
Cash	3,013 96
Accounts receivable	89,897 50
	$4,145,960 88

Liabilities.

Accounts payable and advance payments	$21,973 31
Capital stock	4,000,000 00
Profits and loss account	123,987 57
	$4,145,960 88

These figures show the net earnings to be about four (4) per cent. per annum on the capital of the company.

Although it is a well-known fact that there is a constant depreciation in the value of the gas territory by reason of the exhaustion of gas, and although, properly speaking, an amount should be charged at all times to expense account and credited to a sinking-fund account to meet this depreciation, we have not as yet charged anything to expense account to cover this item.

Your board desires to express the belief that the only safety of the stockholders and to the cities to which the company is piping gas for anything like permanency is in the fact that the company controls territory enough to warrant the longest possible continuation considering the amount consumed, and your board would lay stress on the fact that a smaller field to draw from would neither insure a fair return to the stockholders nor any degree of permanency to the cities supplied.

486 Your board are gratified to say that this company now has about 60,000 acres of gas territory and has also contracts with other parties which would give about 80,000 acres more if the territory proved to be gas territory.

Of course the cost of maintaining our territory in the payment of rentals and royalties is very large and will amount from now on to about one hundred thousand dollars ($100,000) annually.

No officer of the company above the superintendent receives a salary except five hundred dollars ($500) per annum paid to the secretary and treasurer.

January 7, 1889.

THE BOARD OF DIRECTORS,
By CHAS. FOSTER, *President.*
JNO. E. WILKINSON,
Secretary and Treasurer.

487 EXHIBIT No. 4.

To the stockholders of the Toledo National Gas Company.

GENTLEMEN: In accordance with the requirements of your by-laws and from reports received by your secretary and treasurer I beg leave to submit to you a statement of the affairs of the company from the commencement of business on October 1, 1887, covering a period of fifteen months.

During this period the gross earnings from the sale of natural-gas fuel in Toledo, including Auburndale and the insane asylum, amounted to $185,547.91, and Perrysburg, Maume, and sundry small towns $13,833.13, making a total of $199,381.04.

During the same period we expended for maintenance of property and conduct of business, including changing construction, repairs of lines, wells, buildings and telephone lines, drilling wells, operating lines and wells, salaries of employés, damages, taxes, office expenses, tools, supplies, etc., the sum of $99,491.00, and for increasing the plant by the acquisition of territory and extension of lines

in the city and country $60,641.21, and shop accounts $15,466.57, leaving available for distribution or dividend to you as the result of your fifteen months' business $23,782.22.

At the close of business on December 31, 1888, your balance stood as follows:

Assets.

Investment	$2,060,641 21
Shop accounts	15,466 57
Cash on hand	29,927 33
Accounts receivable	4,217 34
Total	$2,106,252 45

Liabilities.

Capital stock	$2,000,000 00
Assets payable	6,362 45
P. & L.	99,890 00
Total	$2,106,252 45

488 Accounts payable, amounting to $6,362.45, are made up as follows:

Liabilities	$4,834 70
Advance gas payments	1,527 75
Total	$6,362 45

Your board of directors has this day declared a dividend to the stockholders of record of this date, payable forthwith, of one per cent. on the capital stock of the company, amounting to $20,000, to be paid out of the earnings of the company for the past fifteen months.

We have a large body of territory, with sufficient gas for the capacity of our lines, and we feel assured that we can supply our patrons as long as any one in Northern Ohio.

Respectfully submitted,

L. H. SMITH, *President.*

WM. CRANE,
Secretary and Treasurer.

489 To the auditor of Lucas county:

In pursuance of the provisions of section 2744, Revised Statutes of Ohio, the Northwestern Ohio Natural Gas Co. submits the following statement of the personal property in Lucas county, Ohio, of which it was the owner or holder on the day preceding the second Monday of April, A. D. 1888, showing the township and village where located:

Stock	$5,611 86
Pipe	1,975 08
Tools	1,371 33
Gates	1,094 69

Horses and wagons	$422 50
16.60 miles 8-inch pipe	43,385 76
2.14 miles 12-inch pipe	11,186 20
16.42 miles 6-inch pipe	20,040 71
7.27 miles 4-inch pipe	6,554 34
4.92 miles 3-inch pipe	3,137 05
.96 mile 2-inch pipe	313 63
Cash First National Bank	2,740 15
8 x 8 regulator	594 00
6 x 8 regulator	757 35
4 x 6 regulator	143 00
Office furniture	800 00
Small pipe, etc., not included in above	5,240 50
	$115,368 16

STATE OF OHIO,
County of Lucas.

I, H. S. Corwin, gen. sup't of the N. W. O. N. Gas Co., do solemnly swear that, to the best of my knowledge and belief, the above statement showing the property of said company in the county of Lucas, State of Ohio, as therein specified, is true.

H. S. CORWIN.

Sworn and subscribed before me this 16th day of June, A. D. 1888.

WM. A. MILLS,
Notary Public, Lucas County, Ohio.

To the auditor of Lucas county:

In pursuance of the provisions of section 2744 of the Revised Statutes of Ohio the Toledo Natural Gas Company submits the following statement of the personal property of which it was the owner or holder on the day preceding the second Monday of April, A. D. 1888, in Lucas county, Ohio, showing the townships, villages, etc., where located:

City of Toledo.

Property.	Valuation.
10-inch pipe, 20,951 feet	$12,444 89
8-inch pipe, 63,416 feet	31,390 92
6-inch pipe, 68,014 feet	23,342 40
4-inch pipe, 57,244 feet	9,817 07
3-inch pipe, 19,616 —	2,362 75
2½-inch pipe, 2,821 feet	242 04
1 regulator, 4 x 8	81 60
2 regulators, 4 x 6	202 80
3 regulators, 6 x 8	573 75
3 miles telephone line	90 00